

THE IRON AGE

A Review of the Hardware, Iron, Machinery

Smithsonian Institution
Washington D C
101

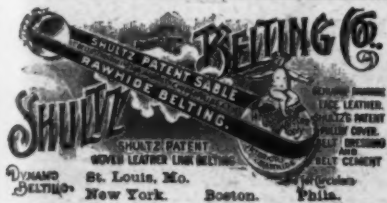
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CAHALL BOILERS See Page 116.

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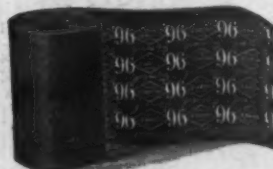
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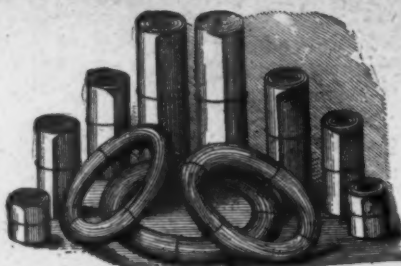
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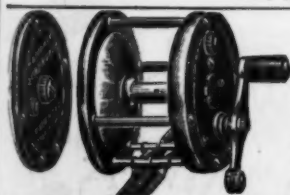
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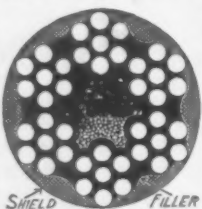
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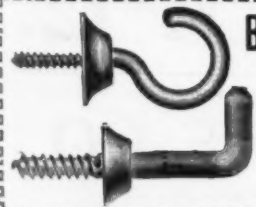
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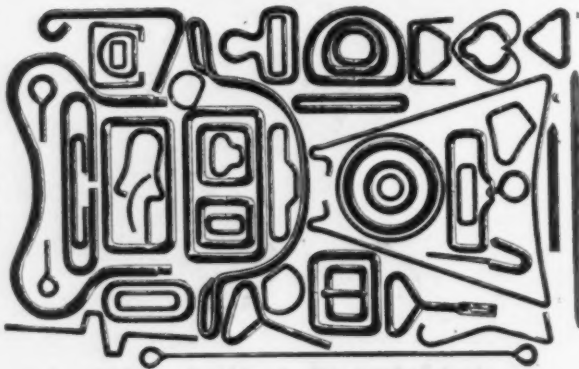
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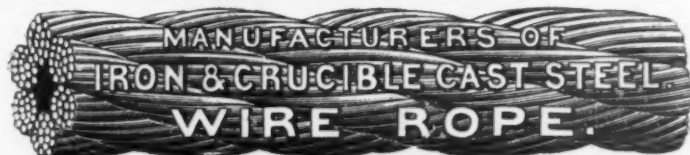
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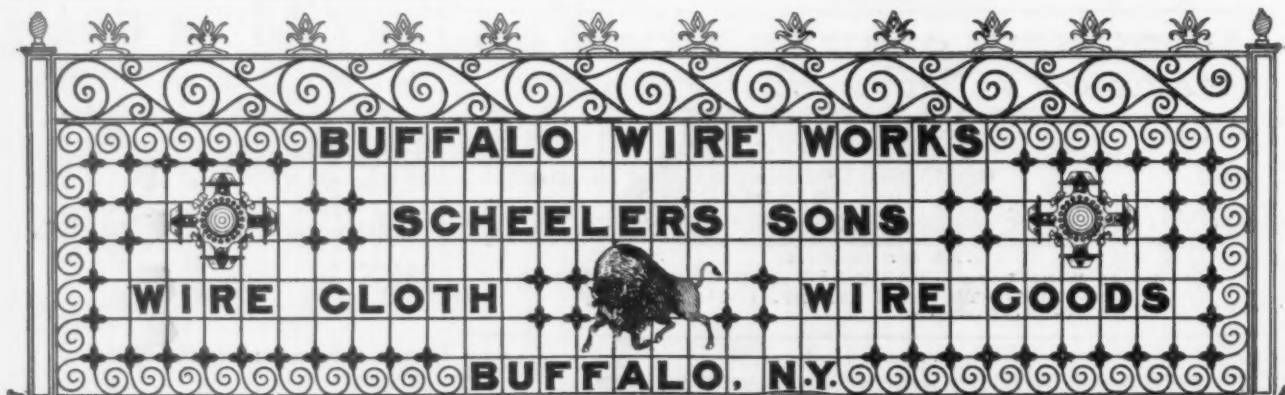
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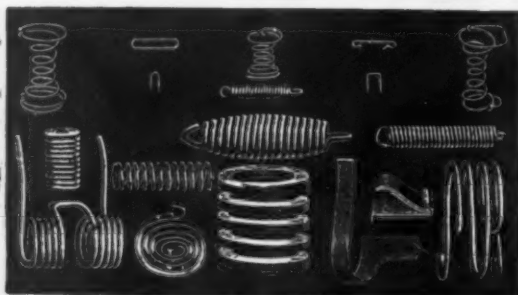
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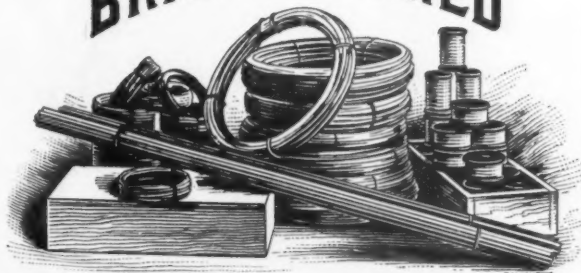
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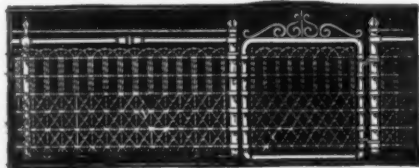
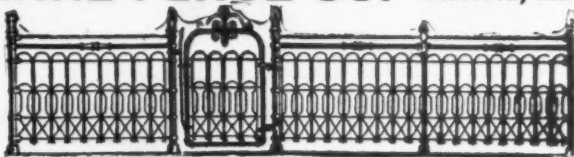
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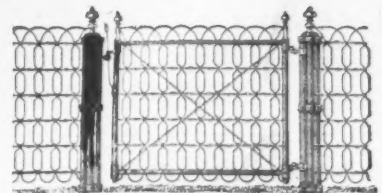
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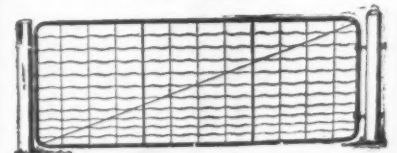
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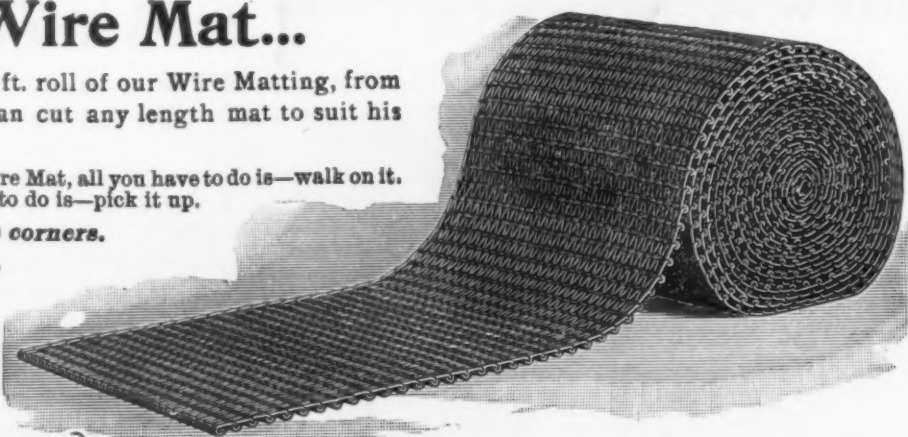
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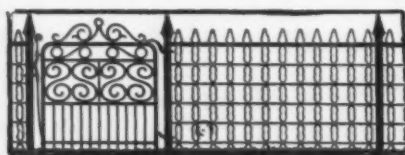
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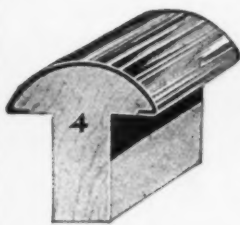
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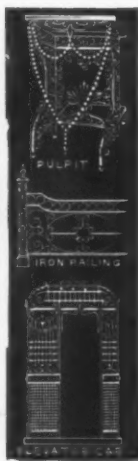
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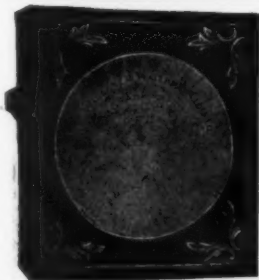
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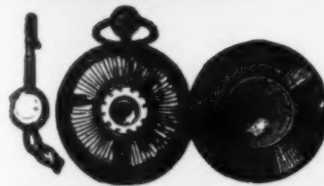
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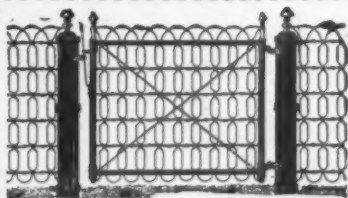
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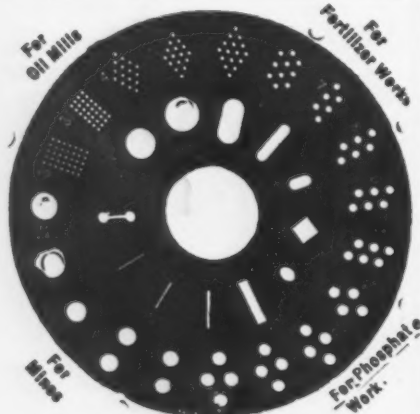
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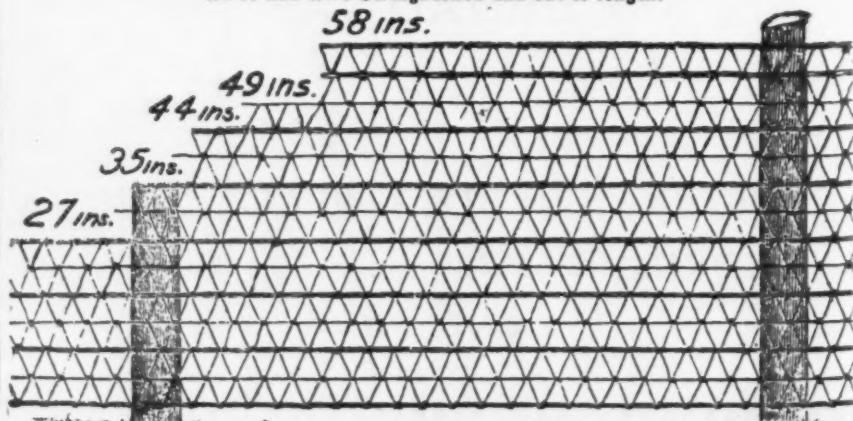
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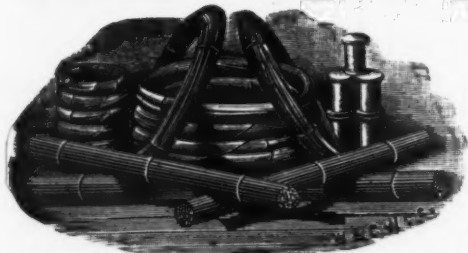
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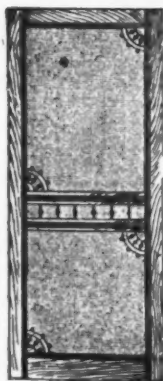
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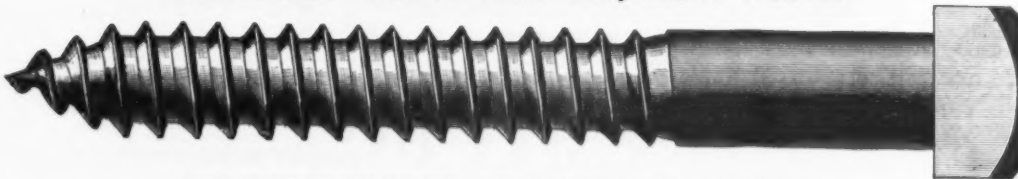
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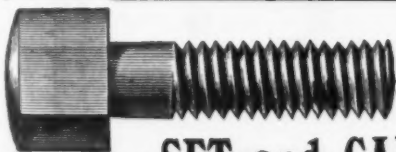
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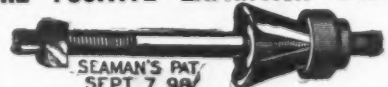
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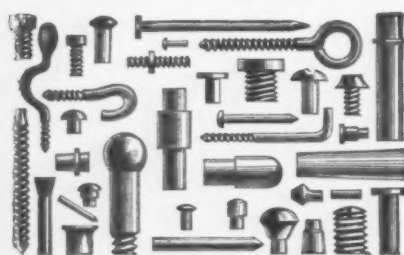
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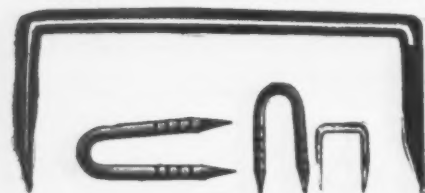
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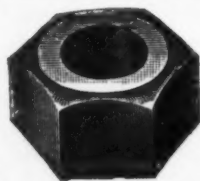
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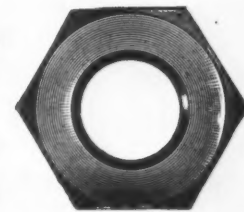
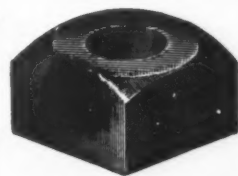
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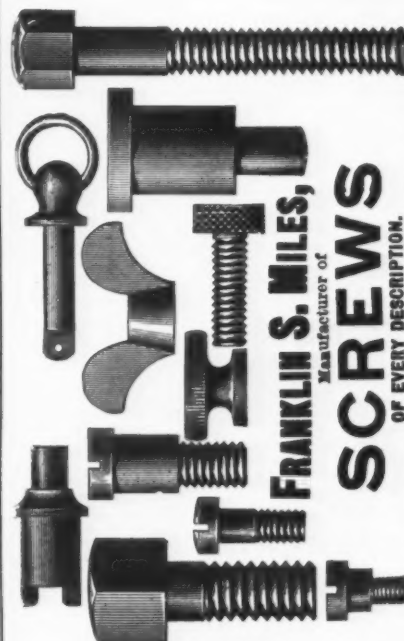


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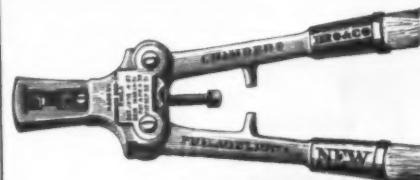


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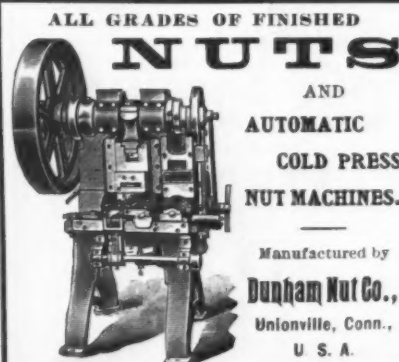
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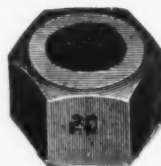
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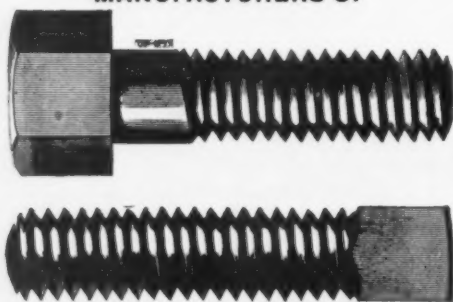
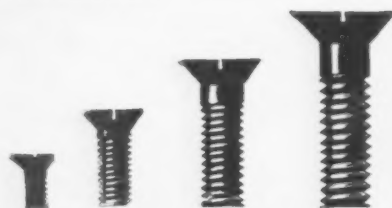
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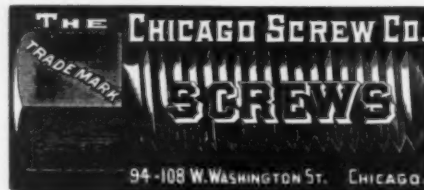
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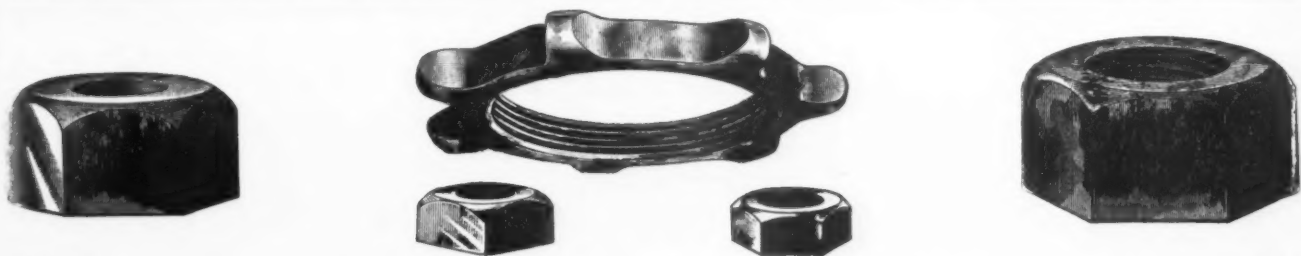


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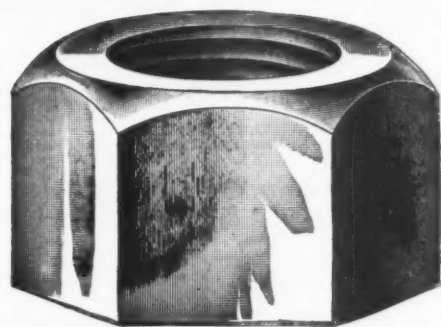
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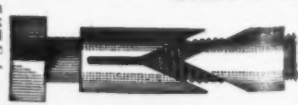
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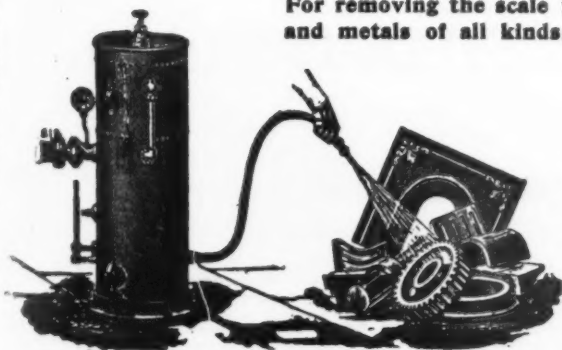
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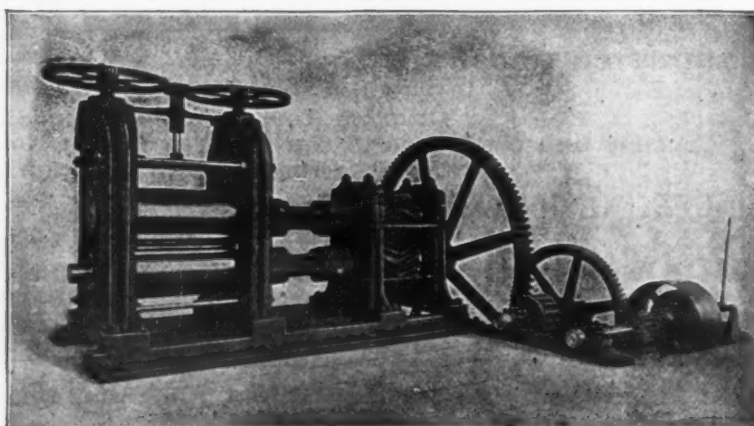
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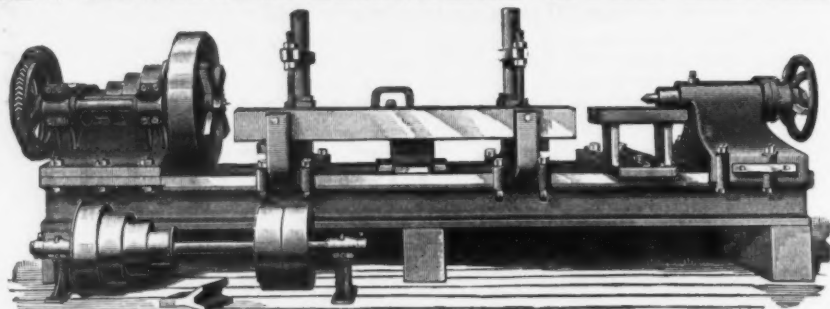
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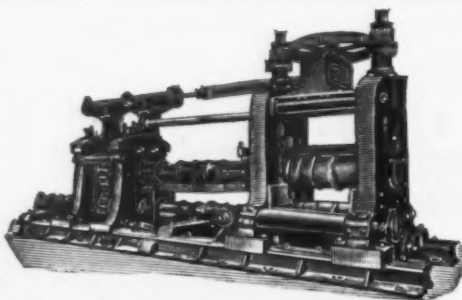
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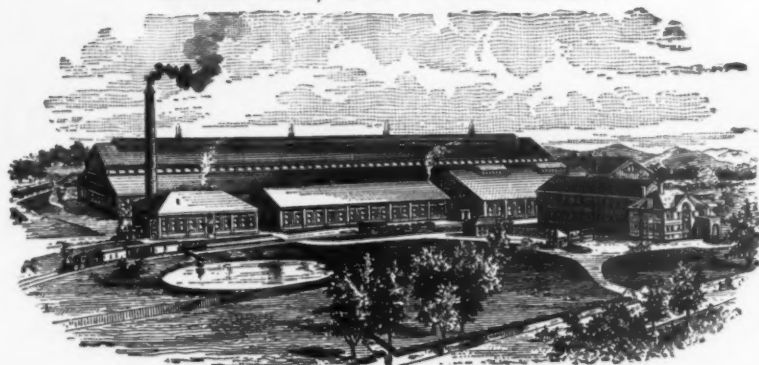
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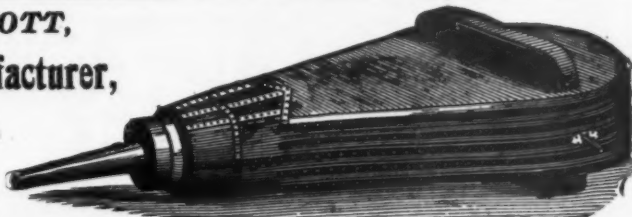
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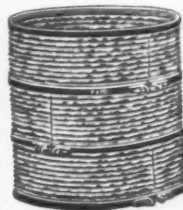
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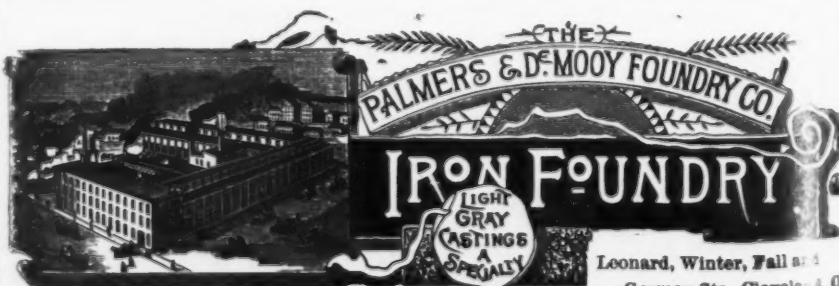
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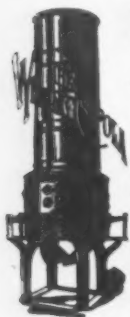
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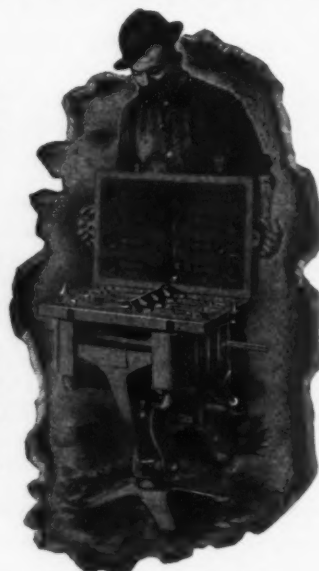
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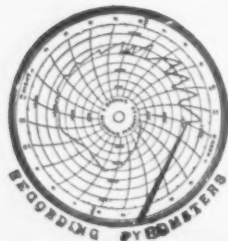
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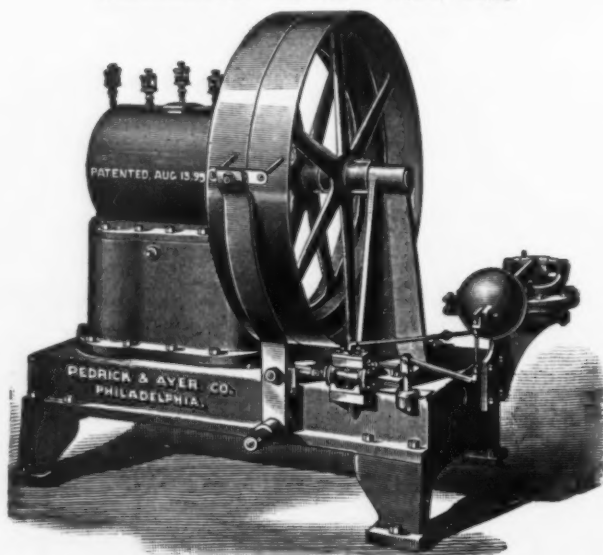
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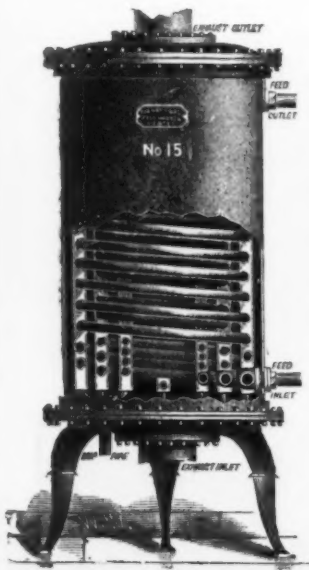
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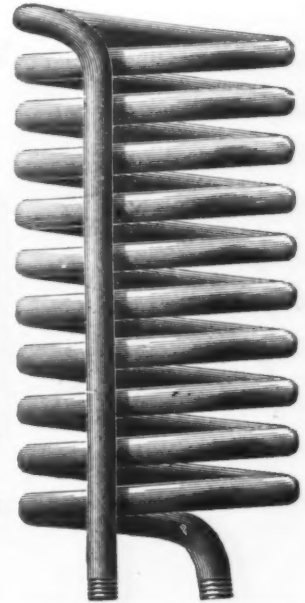


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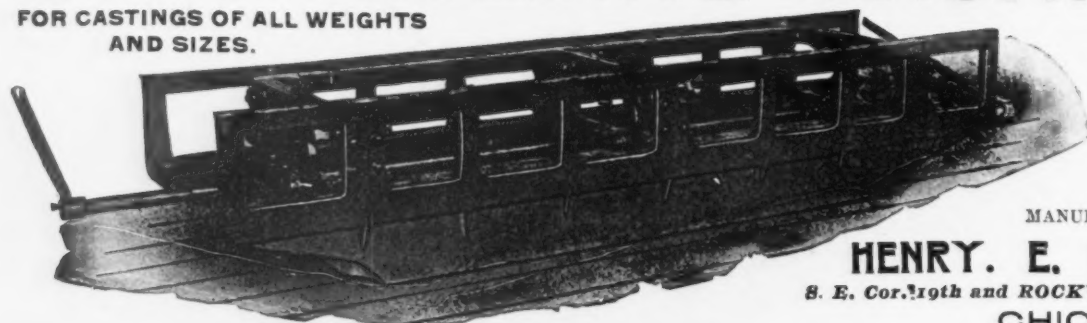
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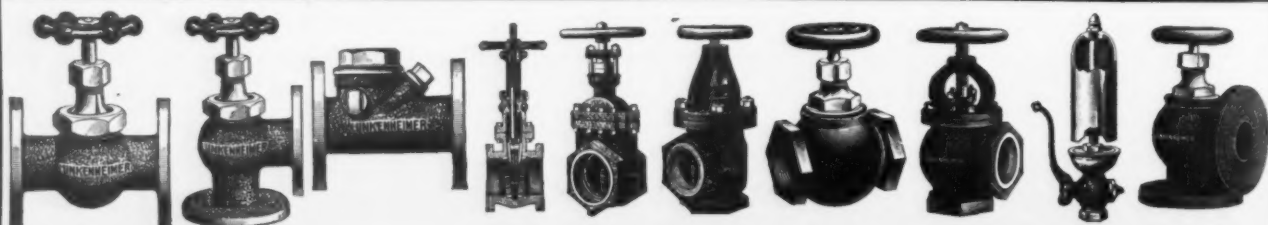
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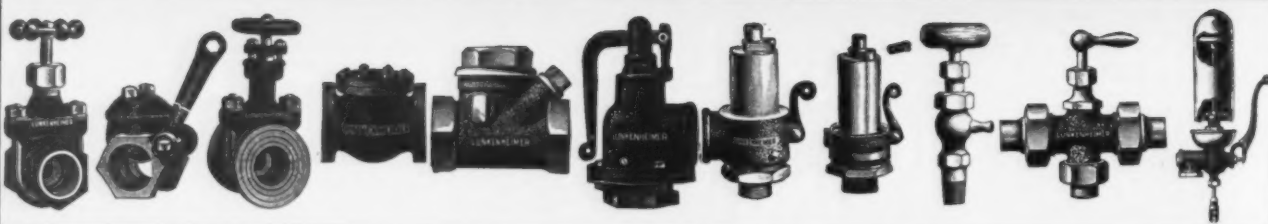
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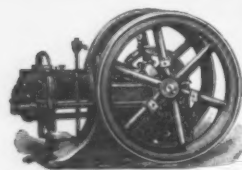
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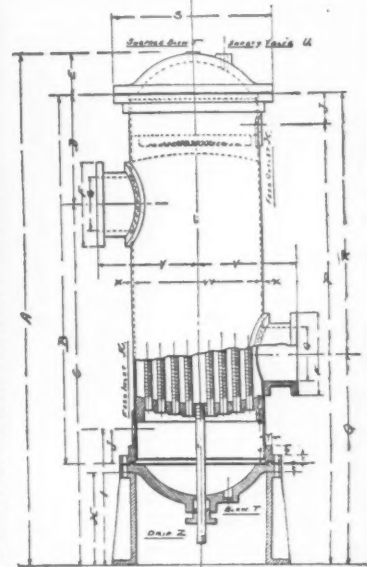
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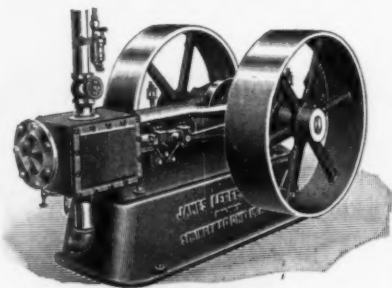
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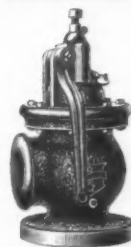
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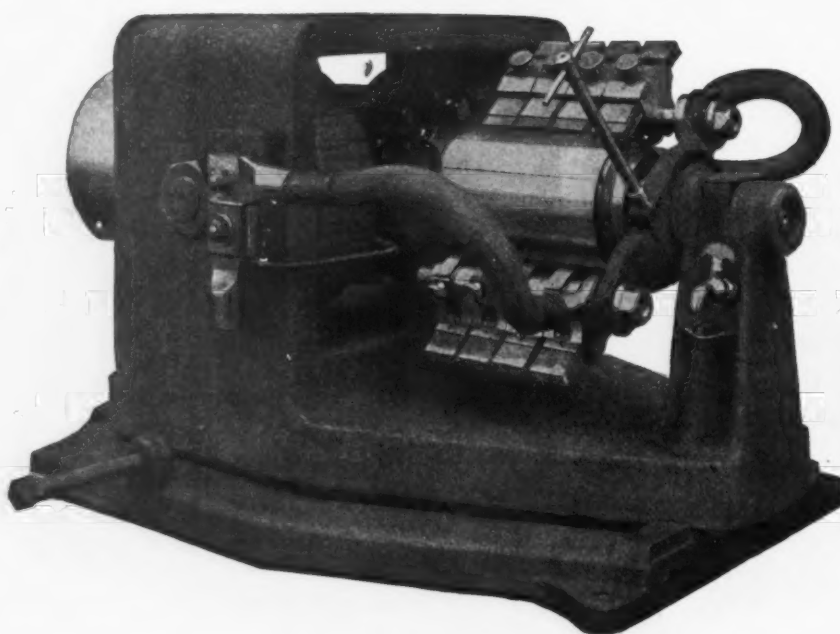
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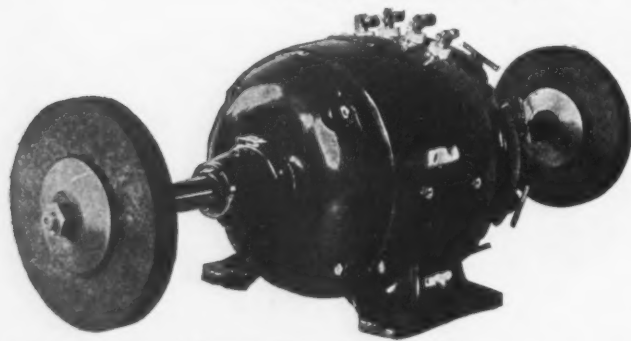
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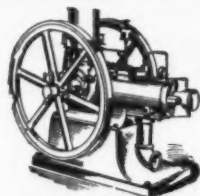
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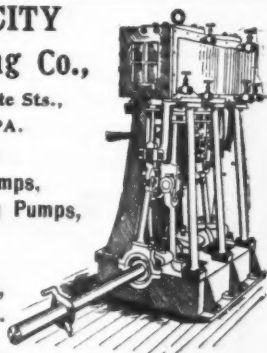
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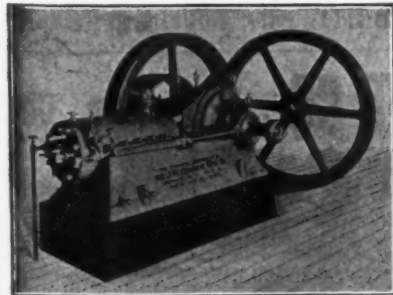
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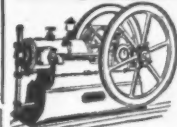
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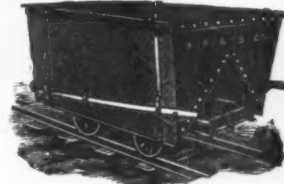
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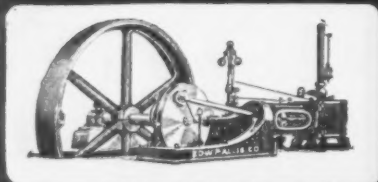


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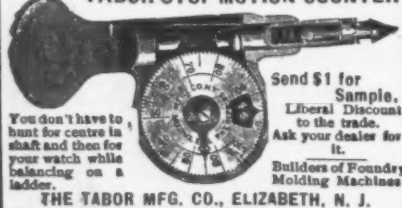
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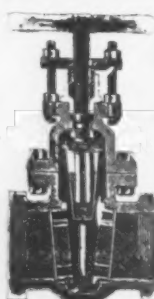
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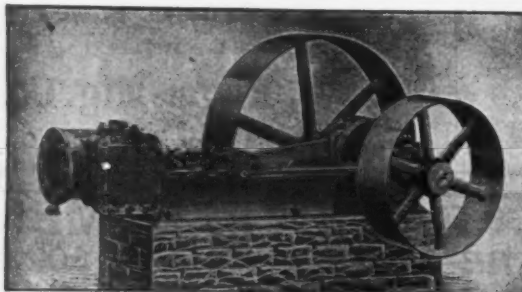
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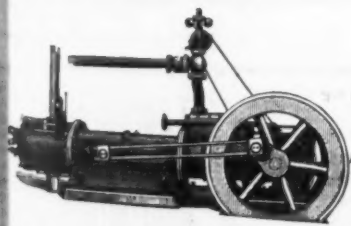
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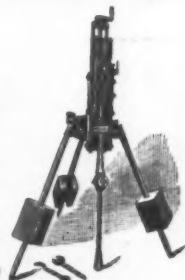
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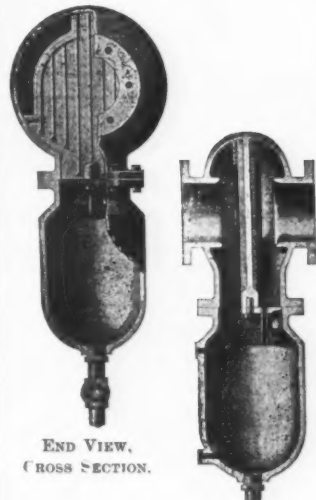


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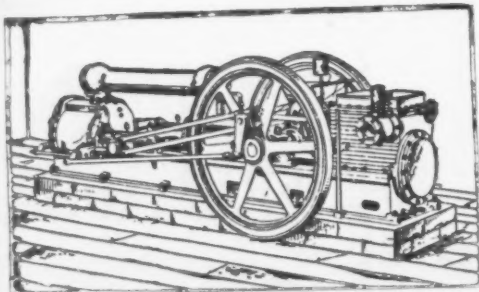
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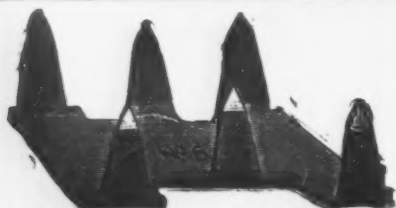
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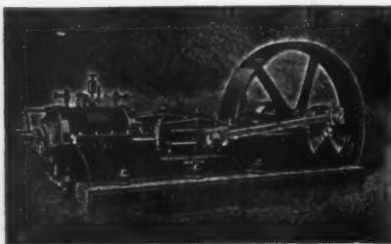


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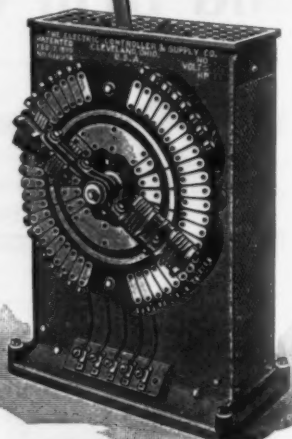
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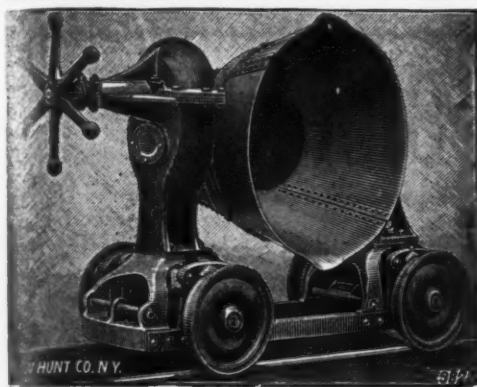
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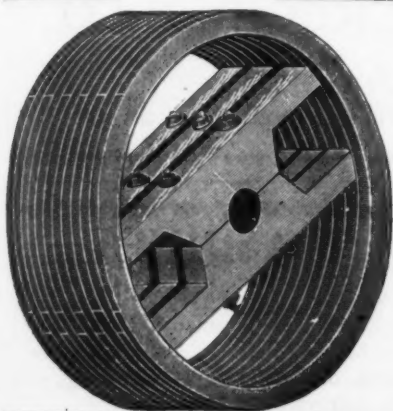
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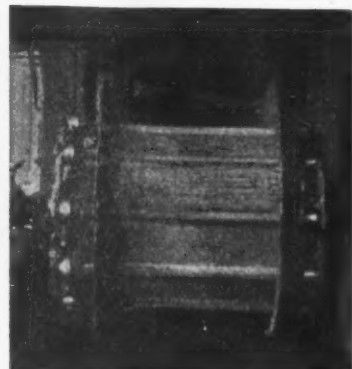
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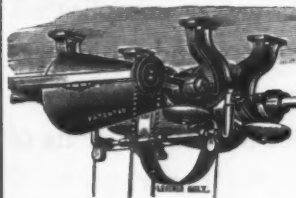
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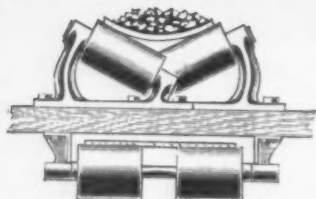
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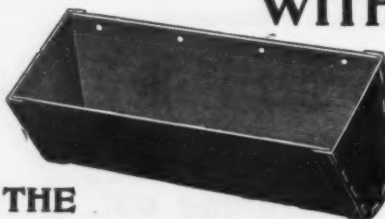
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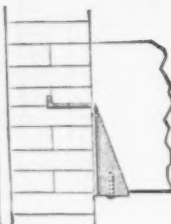
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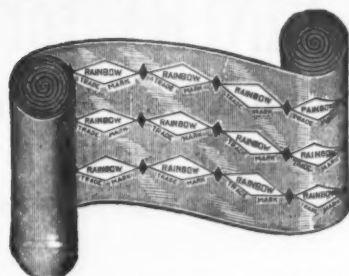
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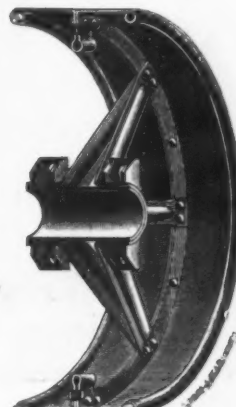
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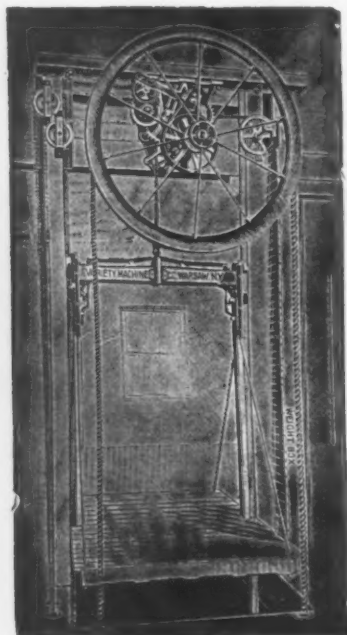
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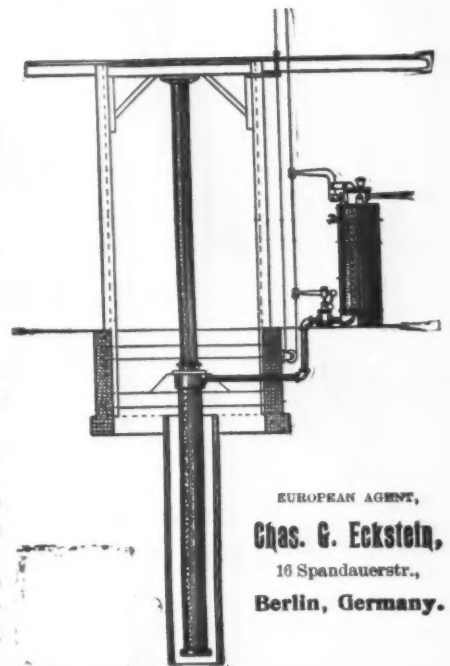
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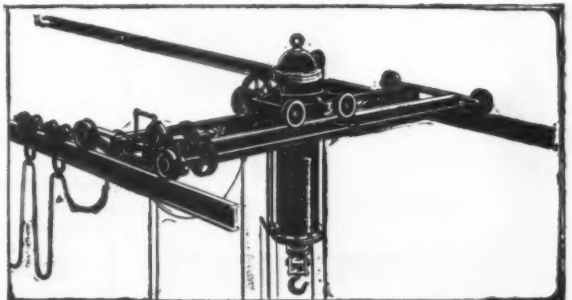
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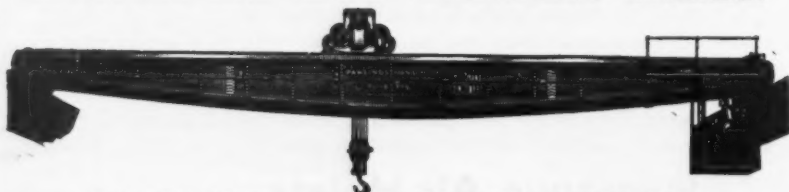


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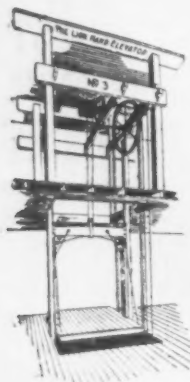
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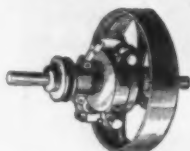
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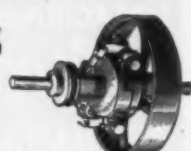
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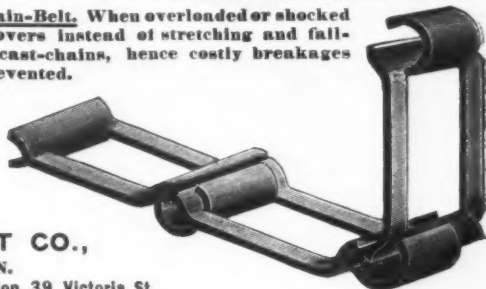
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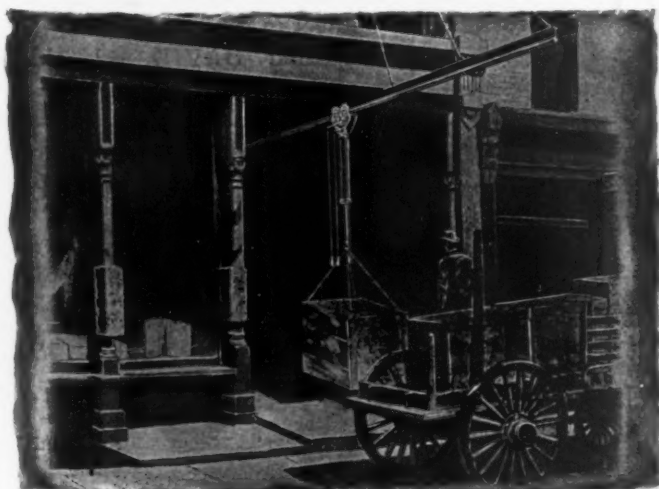
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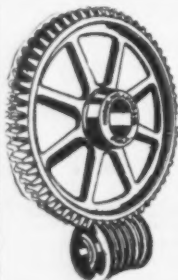
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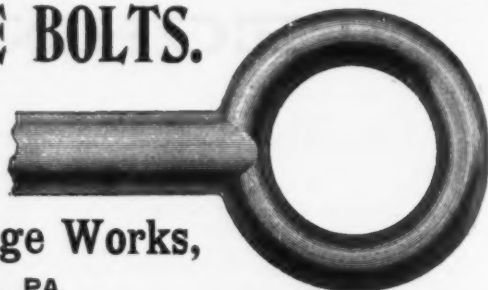
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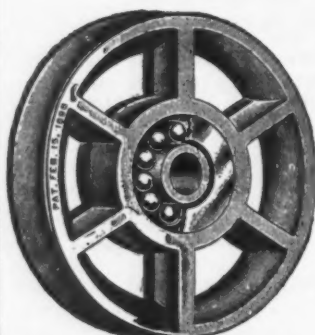


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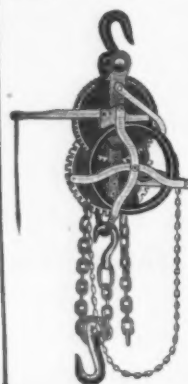
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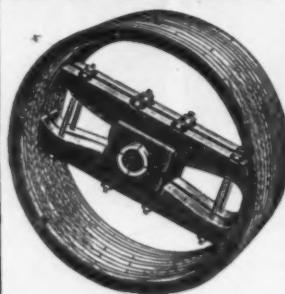


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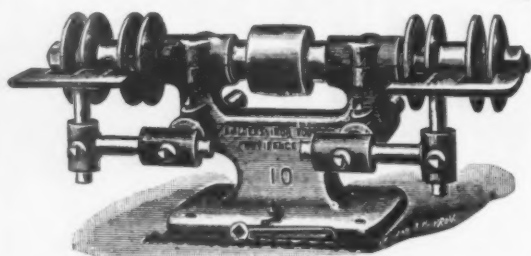
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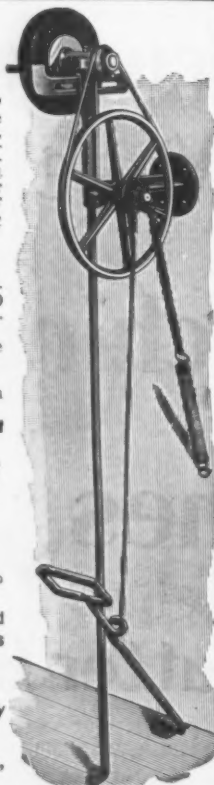
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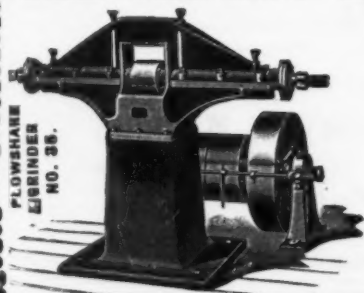
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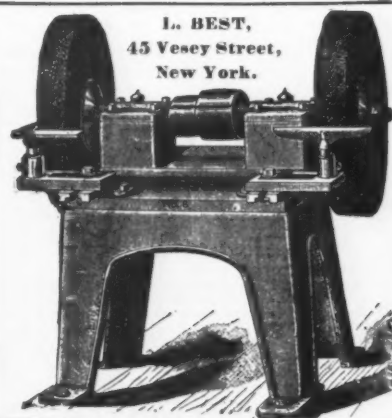
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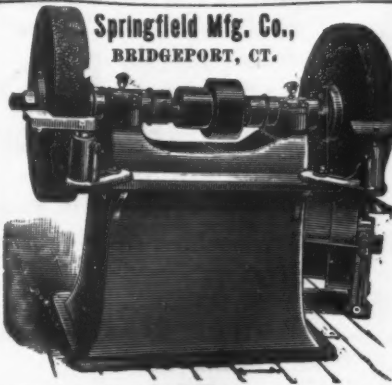
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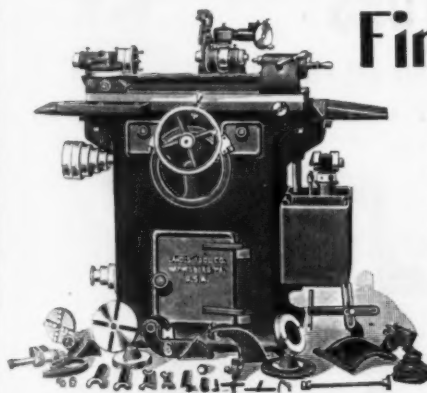
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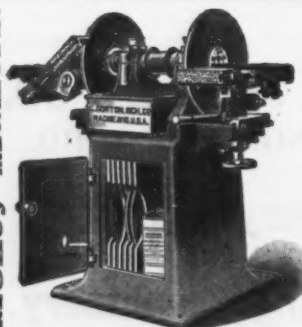
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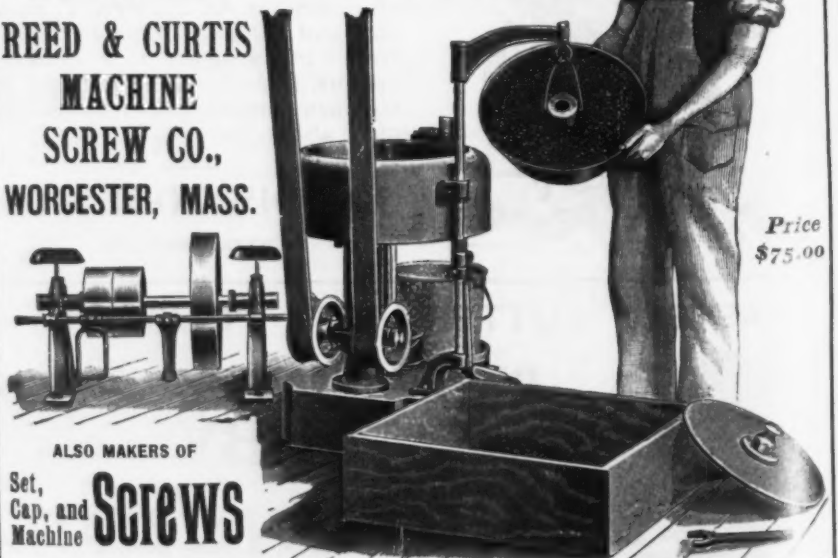
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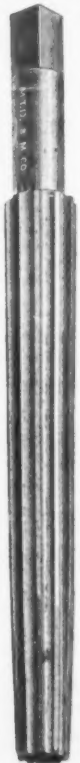
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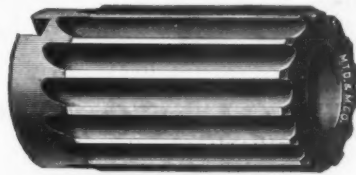
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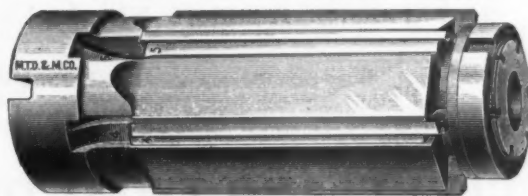
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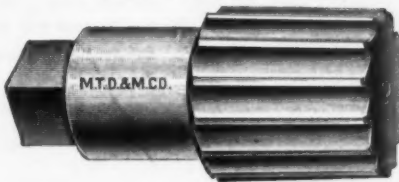
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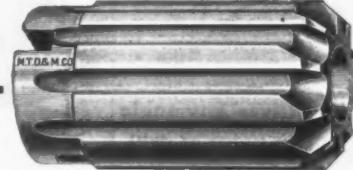
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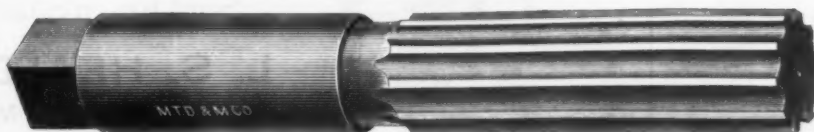
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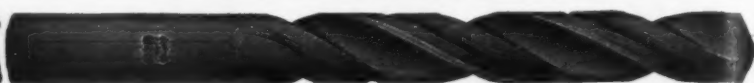
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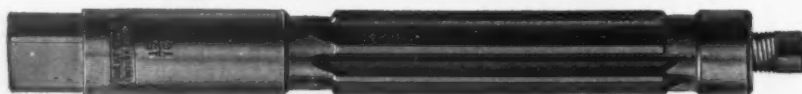
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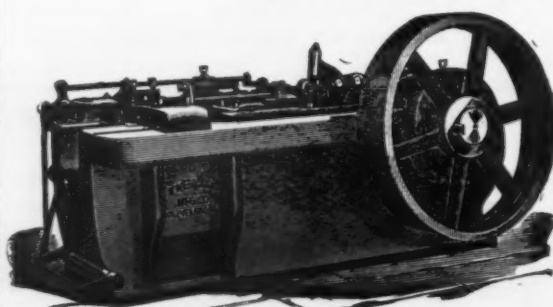


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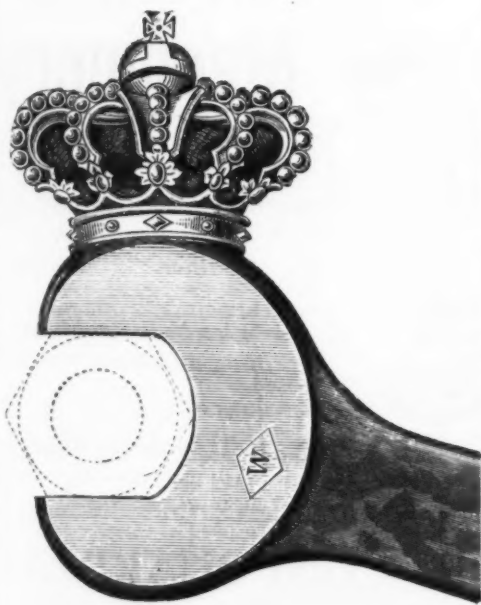
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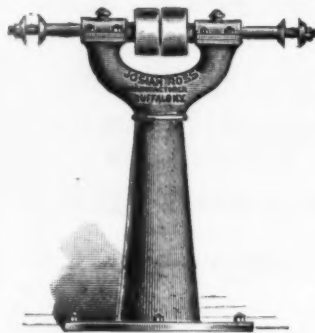
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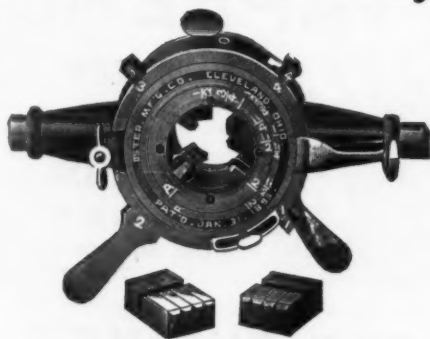
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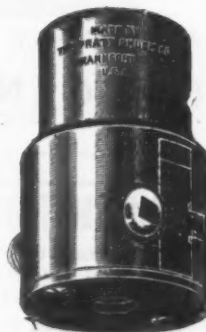
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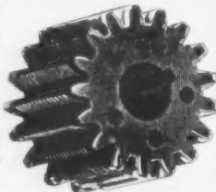
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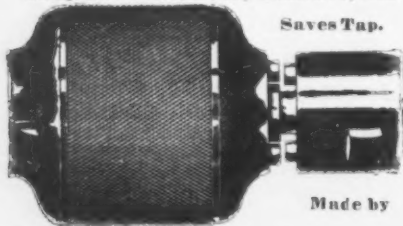
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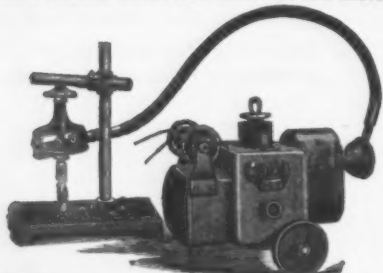
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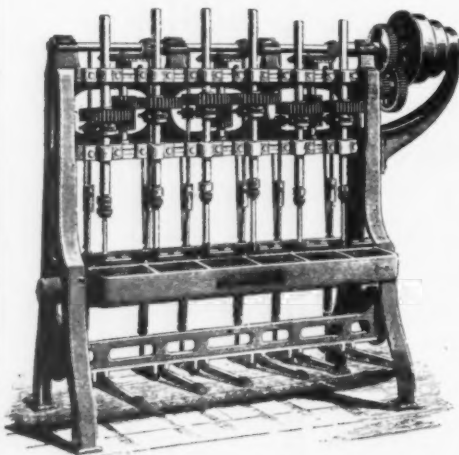
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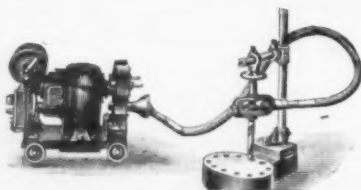
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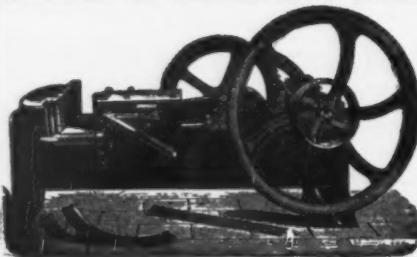
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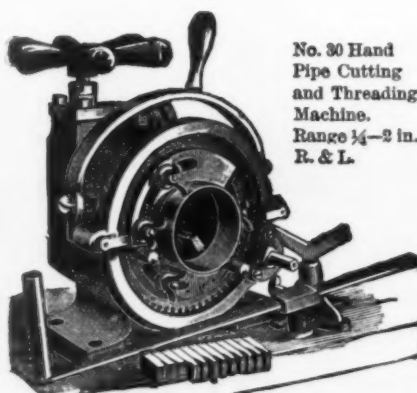
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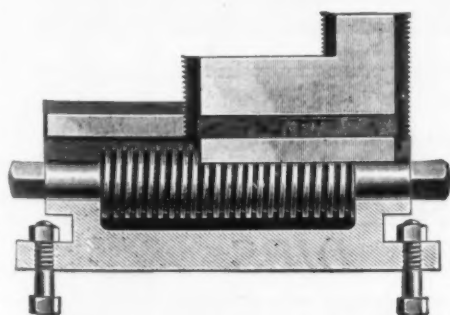
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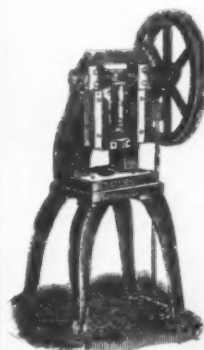
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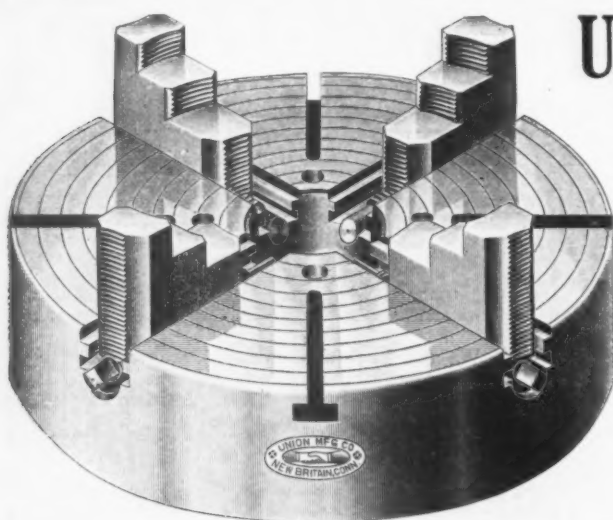
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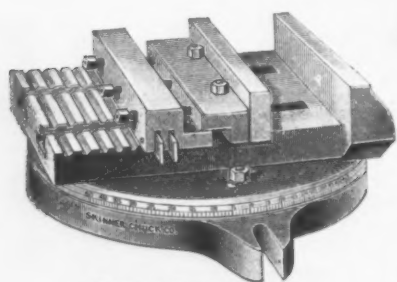
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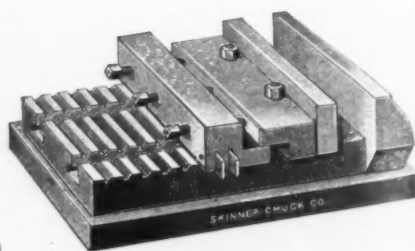


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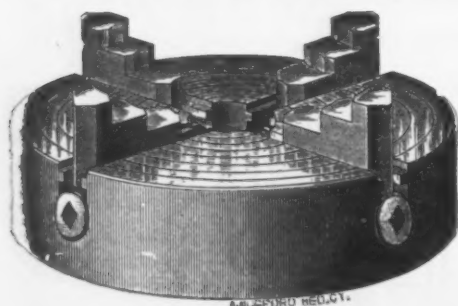
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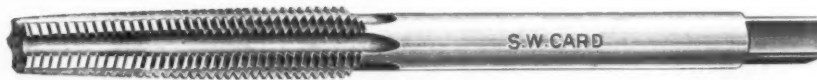
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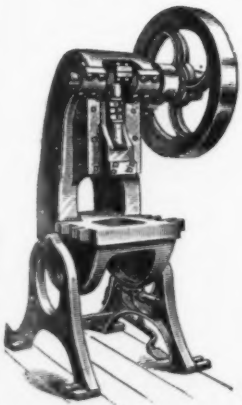
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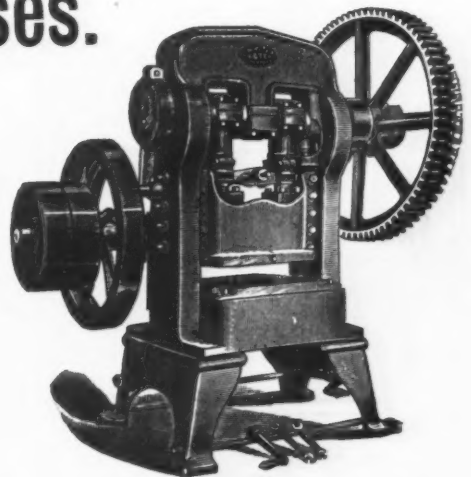


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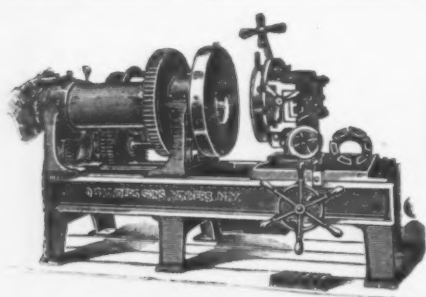
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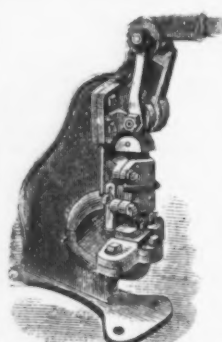
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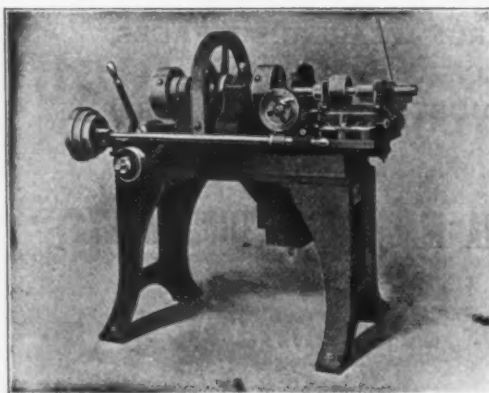


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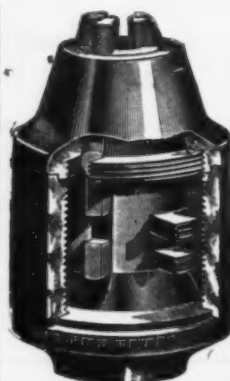
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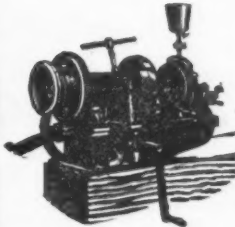
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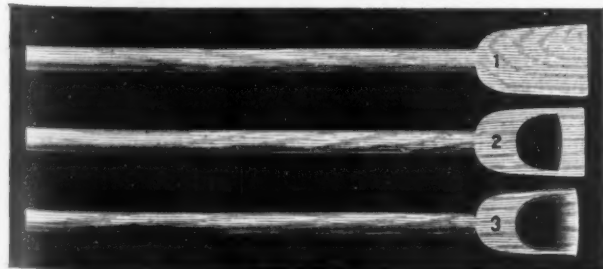
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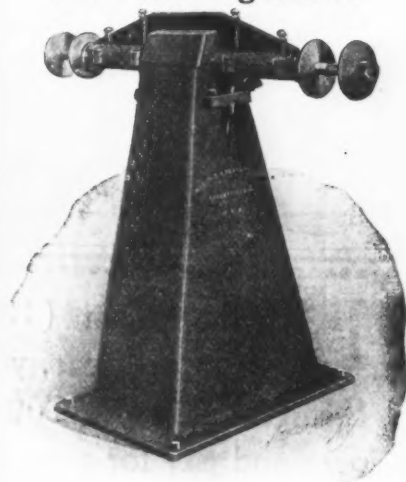
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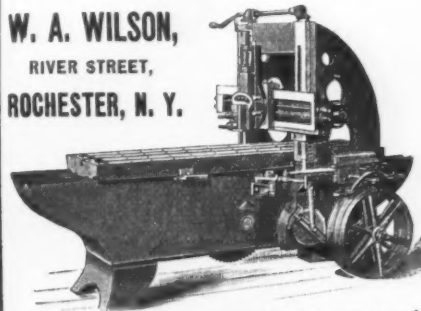
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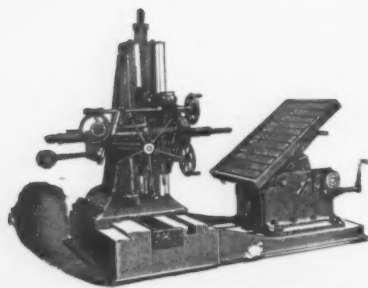
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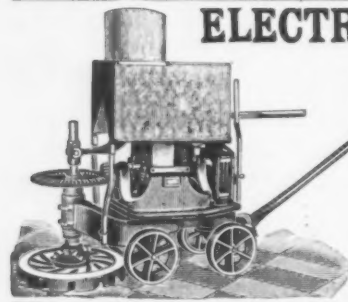
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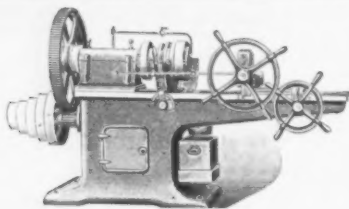
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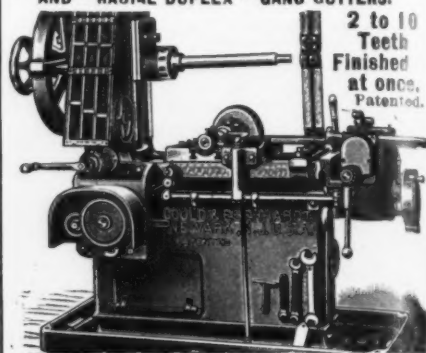
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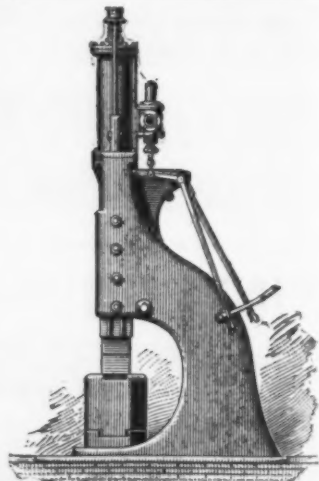
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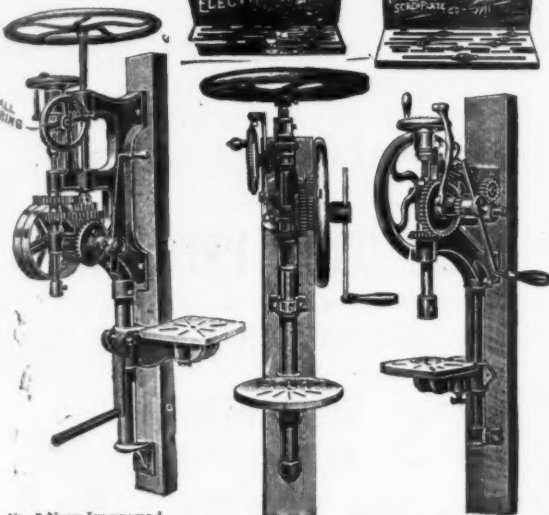
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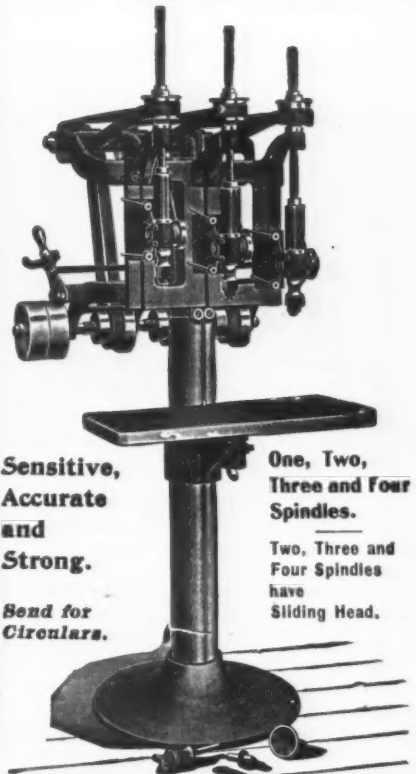


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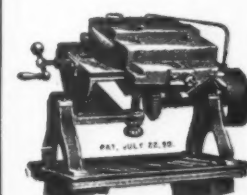
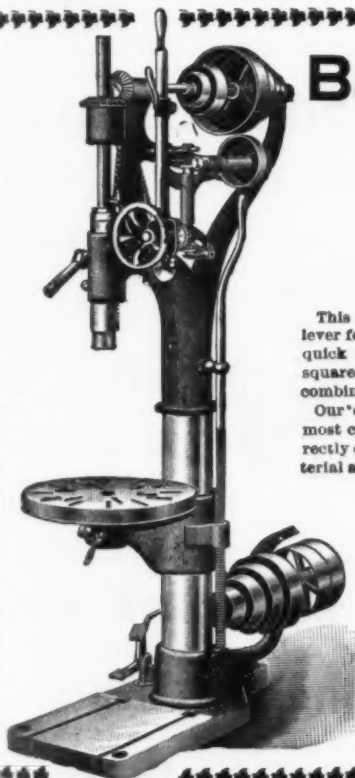
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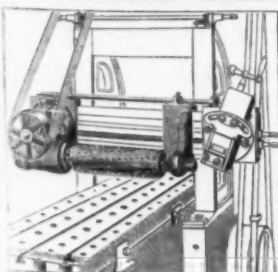
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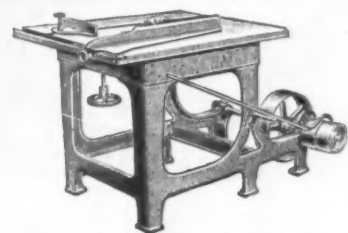
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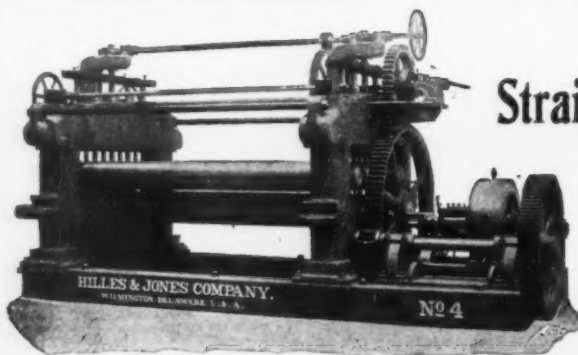
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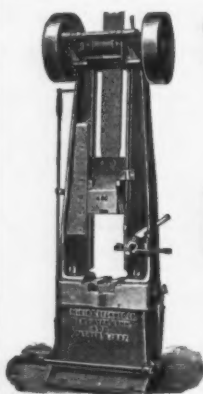
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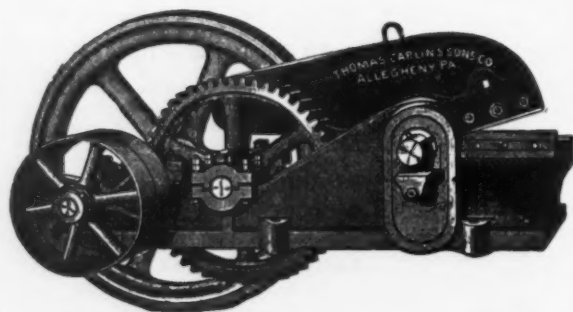


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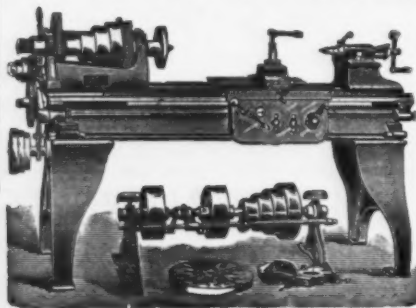
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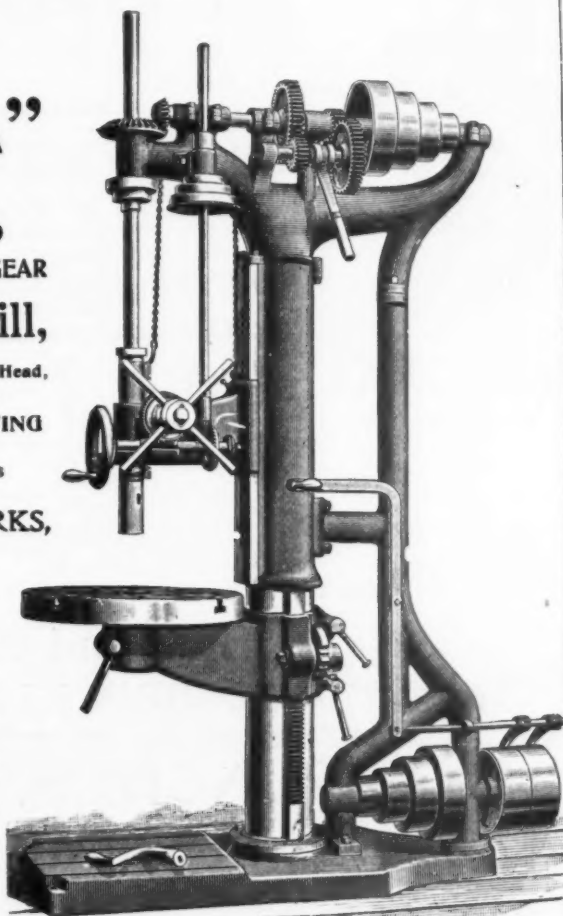
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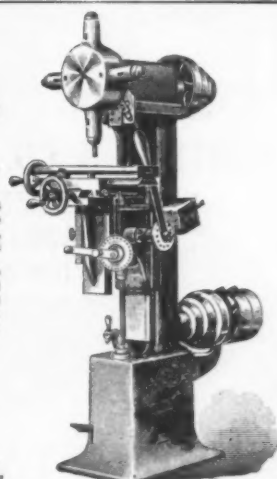
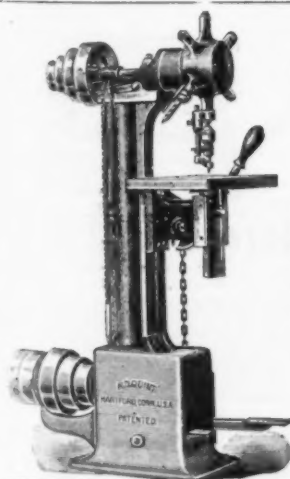
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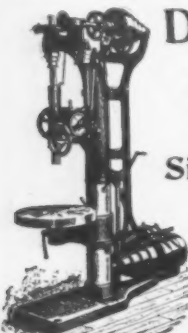
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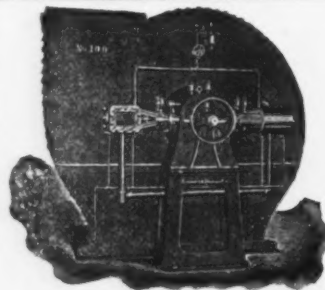
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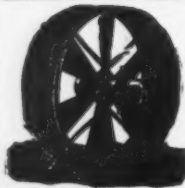
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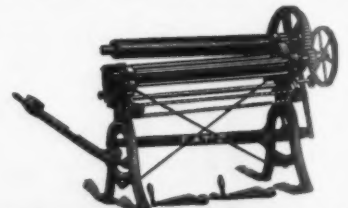
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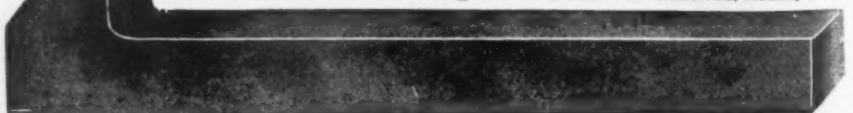
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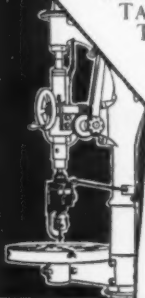
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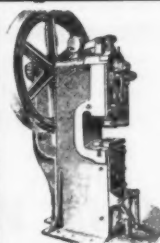
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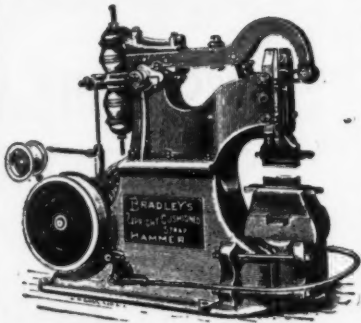
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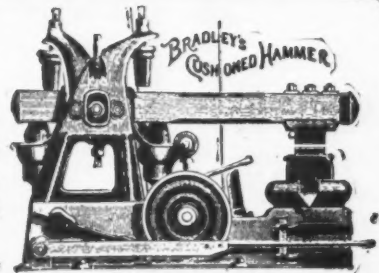
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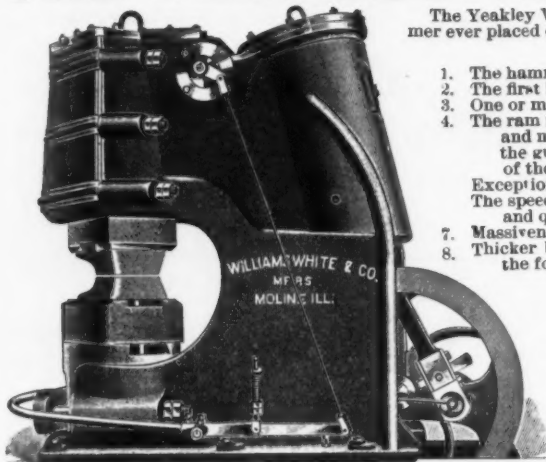
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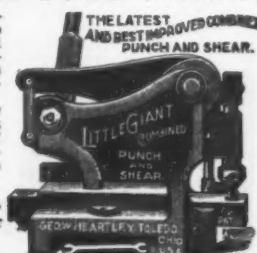
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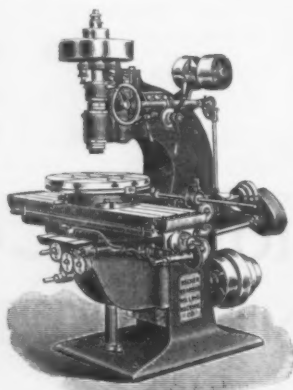
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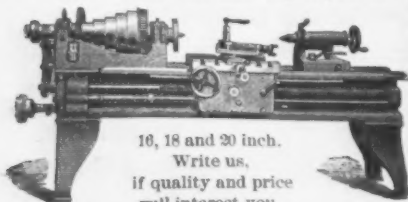
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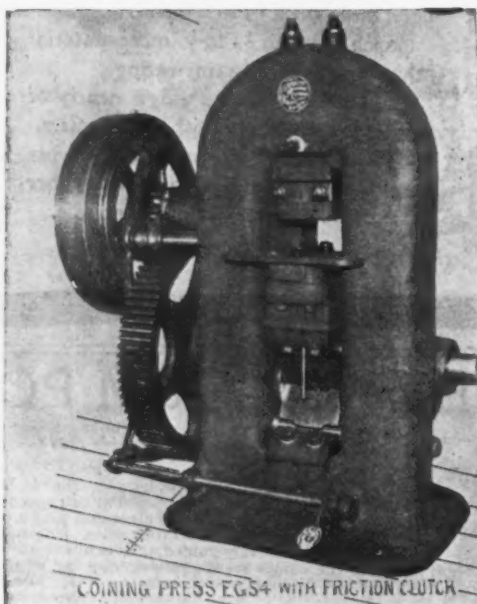
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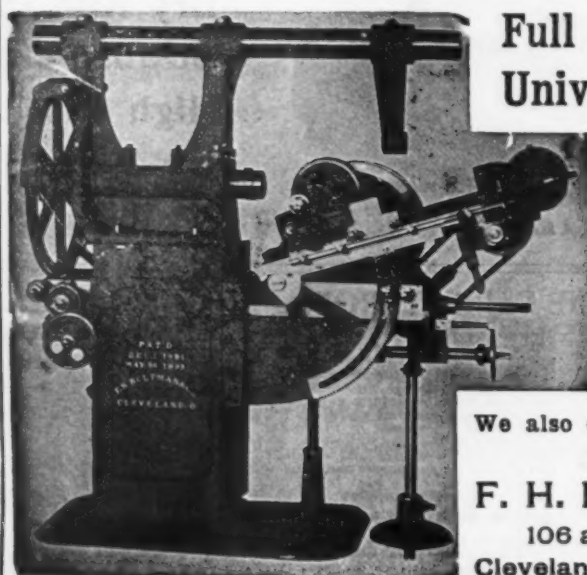
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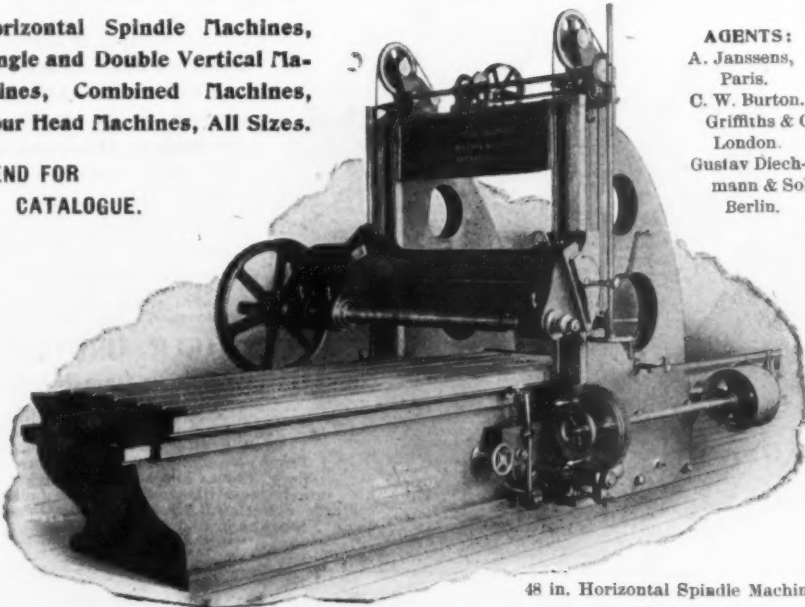
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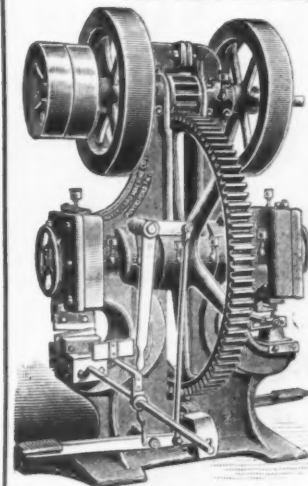
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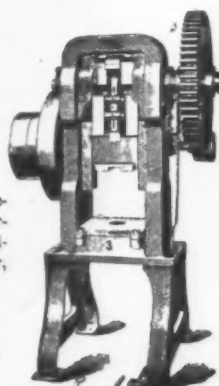
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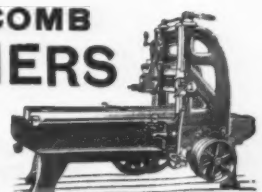
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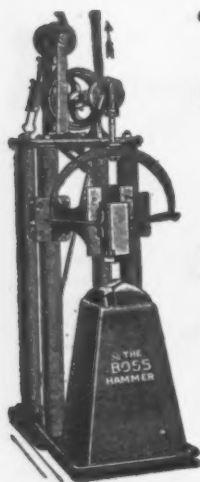
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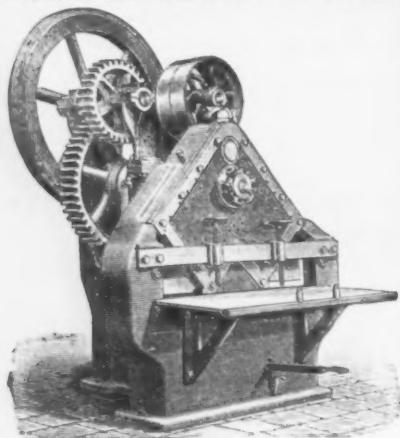
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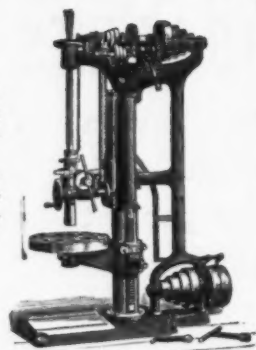
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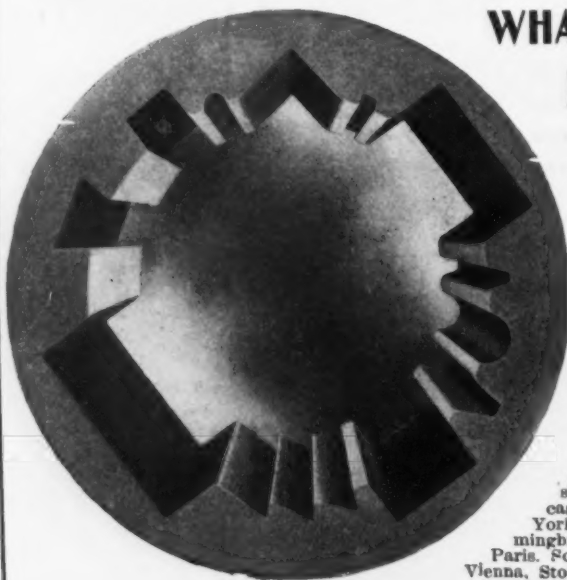


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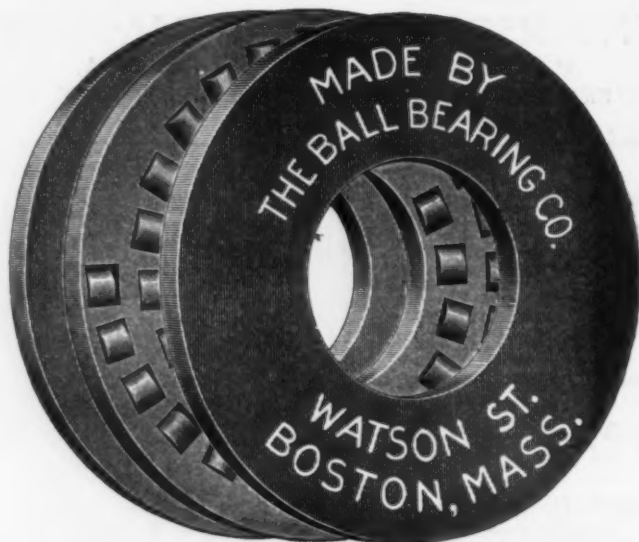
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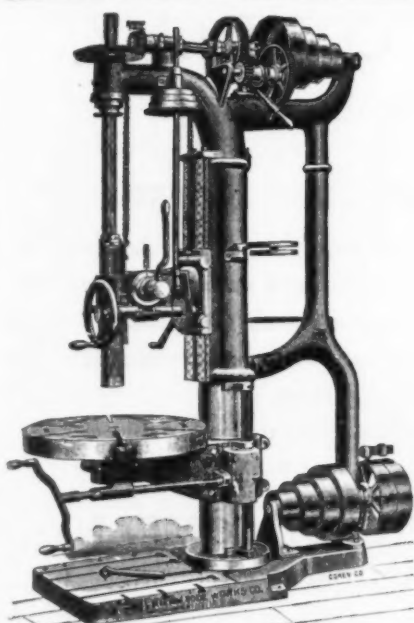
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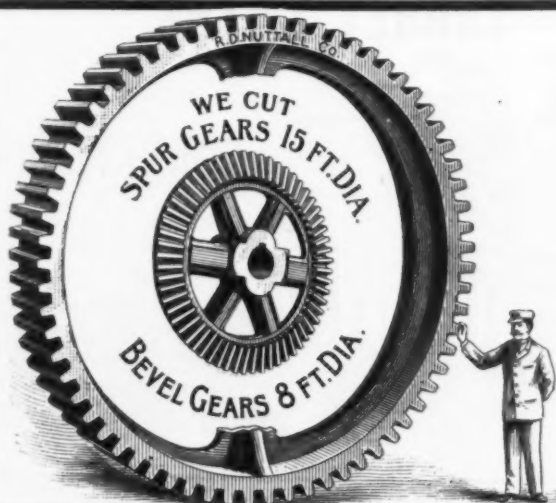


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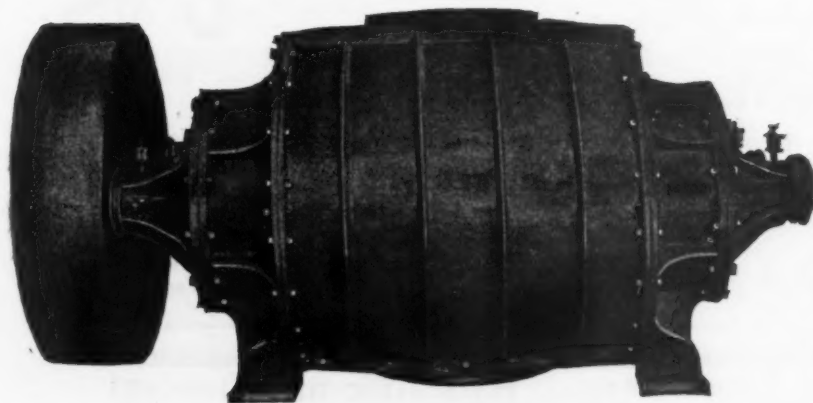
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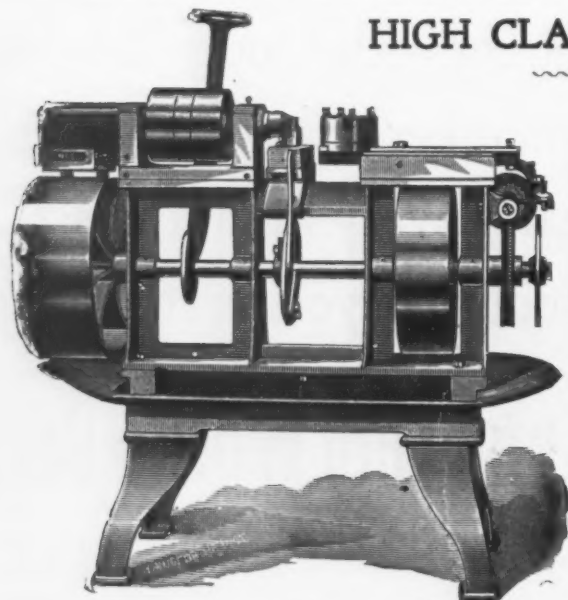
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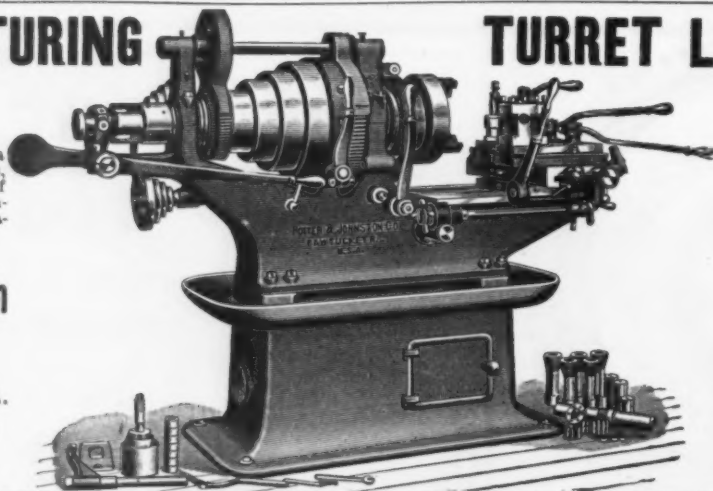
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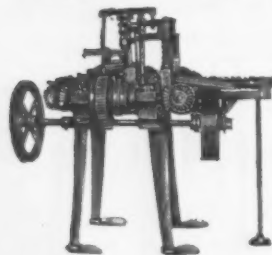
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DESIGNED AND BUILT.

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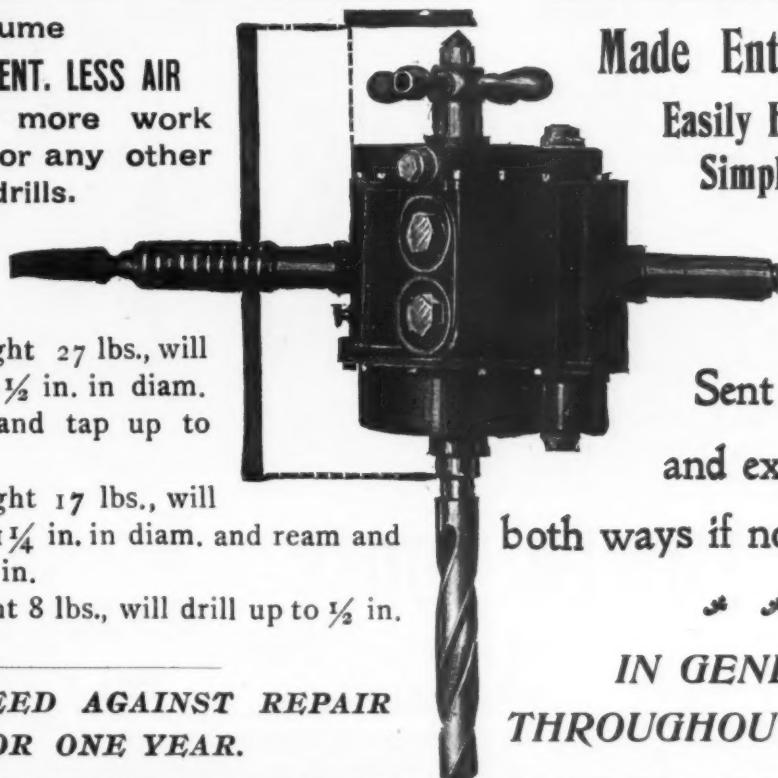
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They consume
FIFTY PER CENT. LESS AIR
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Easily Handled and Operated.
Simple in Construction.



No. 1. Weight 27 lbs., will
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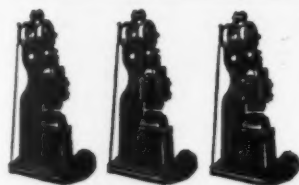
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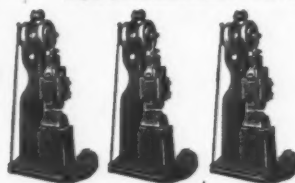
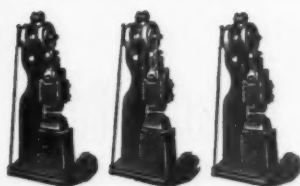
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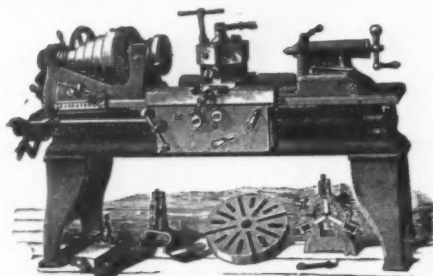
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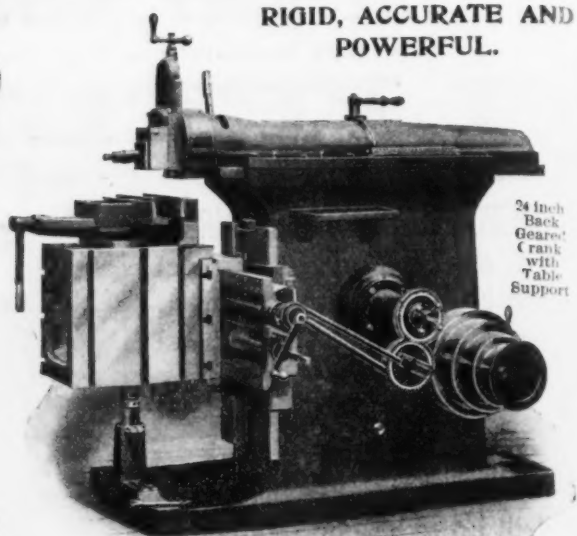
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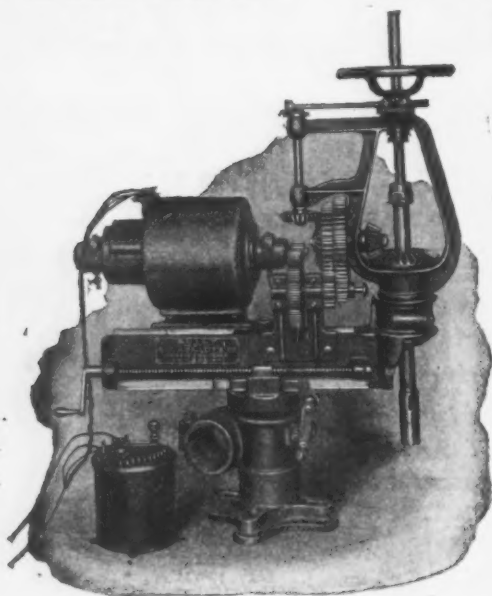
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&c., &c., &c.

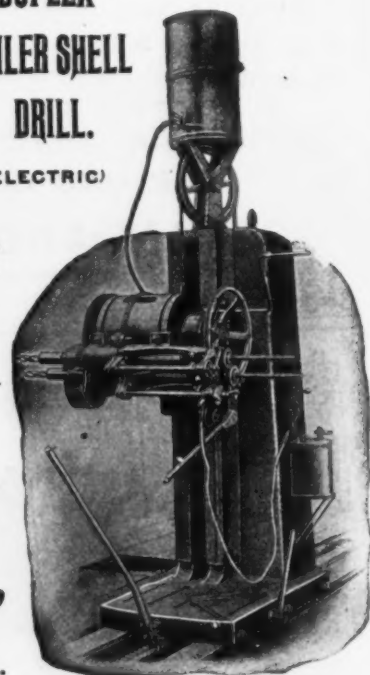
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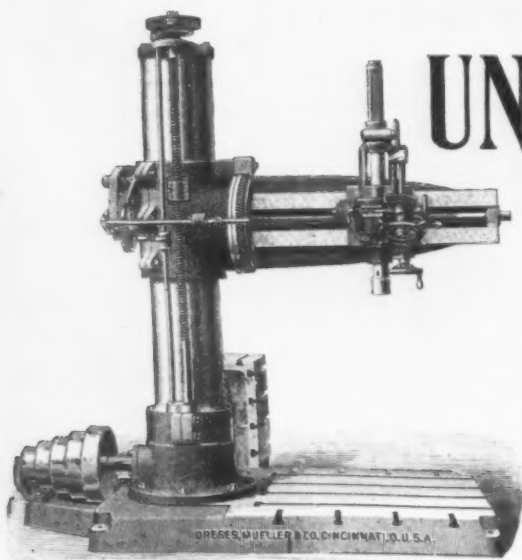
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Entirely operated by one lever always in reach
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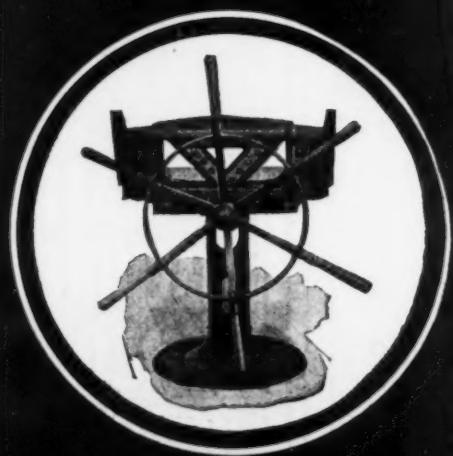
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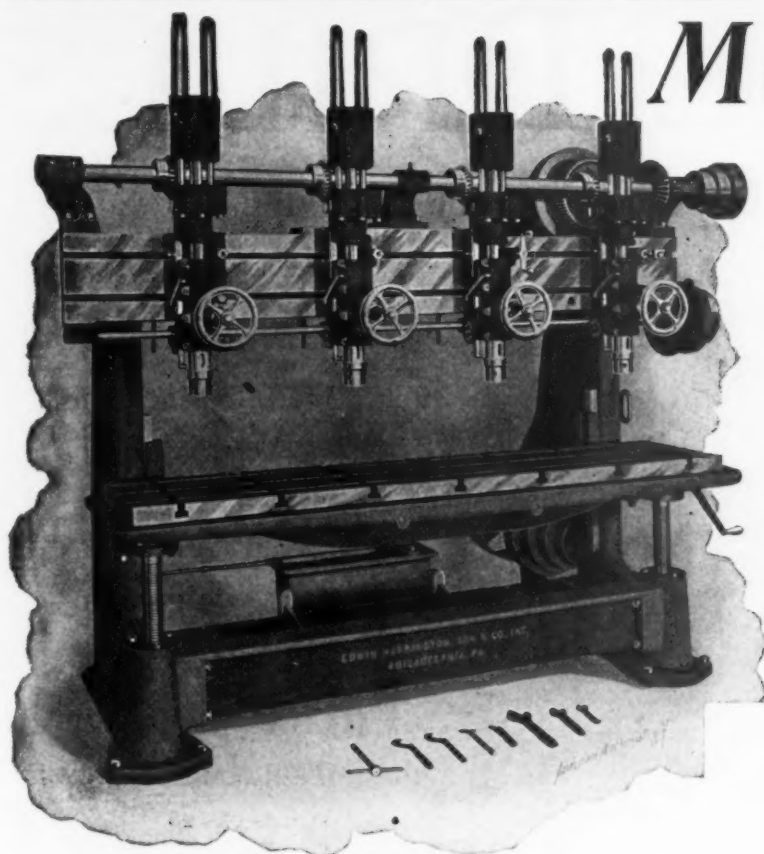


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DRILLS A NUMBER OF HOLES AT
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SPINDLES HAVE INDEPENDENT LAT-
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EACH SPINDLE IS COUNTERBAL-
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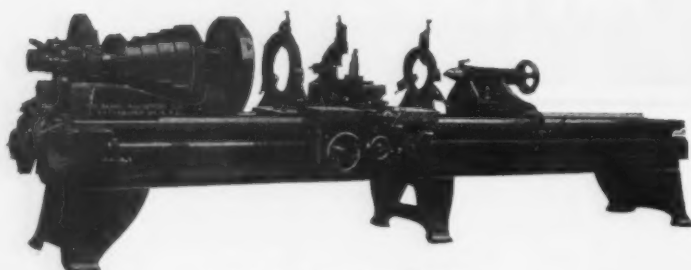
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Multiple Drills

4 TO 24 SPINDLES.



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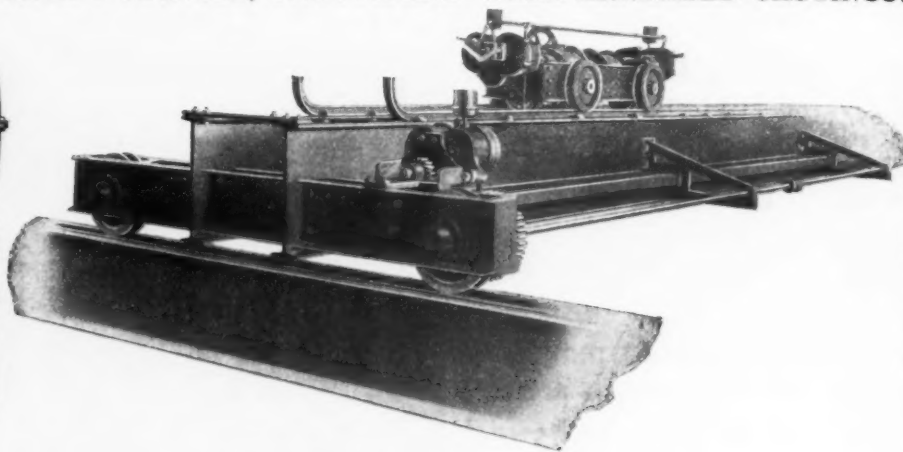
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PROMPT SERVICE, SMOOTH AND WELL ANNEALED CASTINGS.



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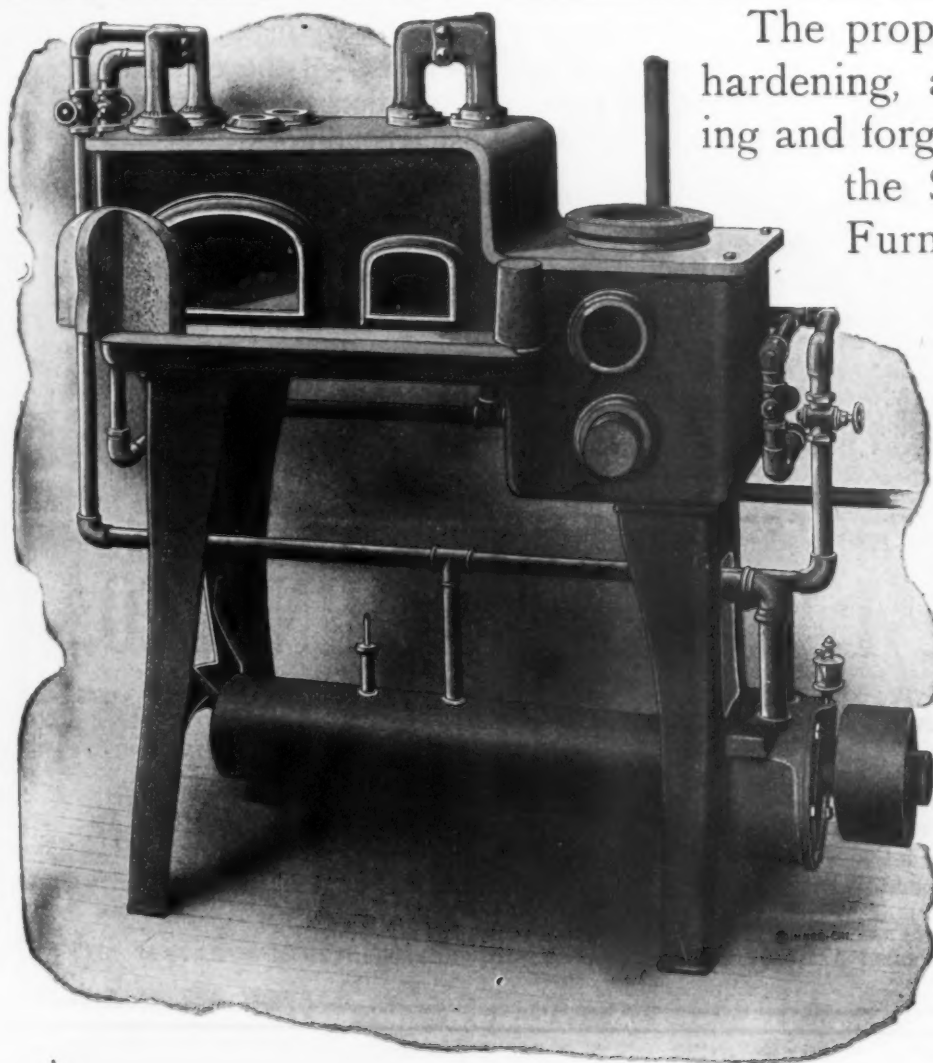
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PNEUMATIC AND HAND POWER

CRANES, CHAIN HOISTS and TROLLEYS.

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The proper way to heat for hardening, annealing, tempering and forging is by the use of the Stewart Gas Blast Furnace, which is here illustrated.

THE Stewart Gas Blast Furnace is intended to take the place of the old coal or coke forges with their material and money wasting proclivities. It is for the economical and sure heating of small tools of all kinds to just exactly the right temperature for annealing, hardening, tempering or forging. It is especially a machine shop furnace, combining as it does a muffle furnace, crucible furnace, forge, pressure blower and air reservoir on one base; is easily removed if necessary and need not be connected to the chimney. Why a concern should bother with an old fashioned forge when a forge of this character can be had at a reasonable first cost passes understanding. This is a forge or furnace that is always ready; why the time wasted in a year on an old fashioned forge—all coal or coke forges are old fashioned—would just about pay for an installation of this good kind. The heat can be so regulated as to wholly eliminate the element of guess work and can be relied upon always. Quite a bit of literature sent on request.

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The Chicago
Flexible Shaft Co.,
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In Time of Peace Prepare for War. In Prosperity Prepare for Dull Times.

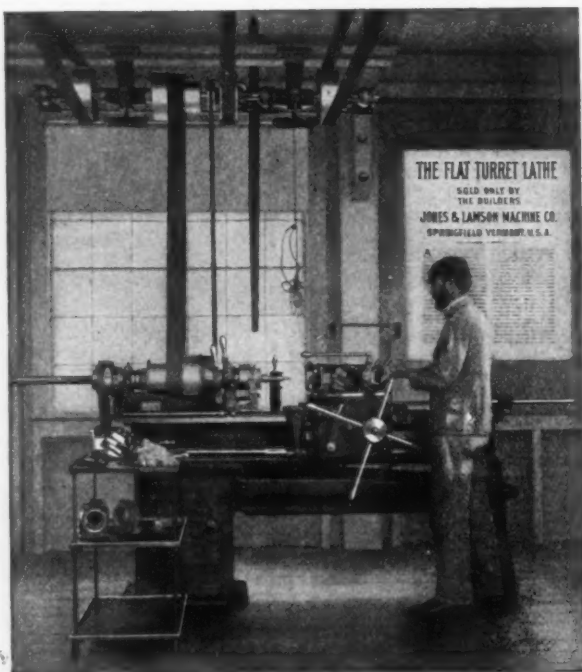
What does your labor cost per year? What is your output?

Remember that the implements in the hands of your workmen determine the relation between the cost of labor to amount of output.

Whether in war or manufacturing the best implements are essential to success.

That there is no Trust or Combination big enough to disregard this fact, no machine shop too small to profit thereby.

If you can afford to use obsolete methods you are rich enough to buy a Flat Turret Lathe.



The Flat Turret Lathe is made in one size only, and we make nothing else. It combines the convenience and simplicity of the engine lathe with the speed of the turret lathe and in addition possesses an accuracy of working exceeding both under the usual conditions.

It is furnished with complete outfit of Tools, including the Hartness Automatic Die, and turns out nearly every conceivable shape under 2 in. in diameter and 24 in. long when working from full length bars, also larger diameters when handling forgings or pieces that do not pass through the spindle.

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Tools for Screw Machines

is most complete and up-to-date.

We make a special study of this class of tools.

Adjustable Self-Opening Screw Cutting Die Heads

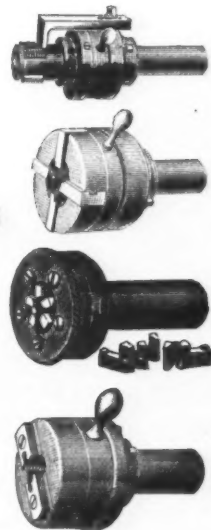
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various sizes, either for turret use or live spindle.

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many sizes and styles for turret or rotary use.



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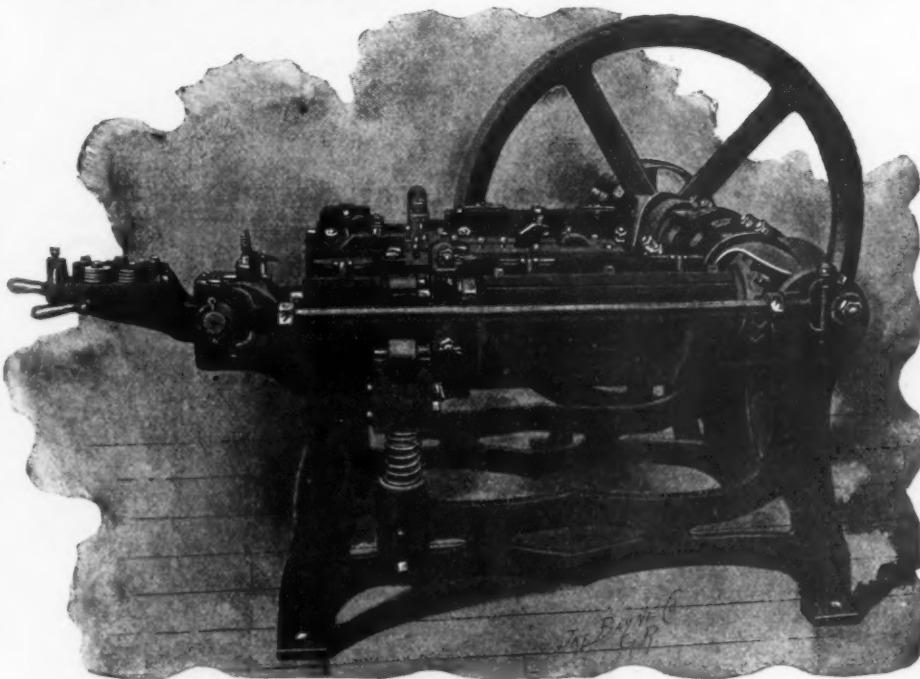
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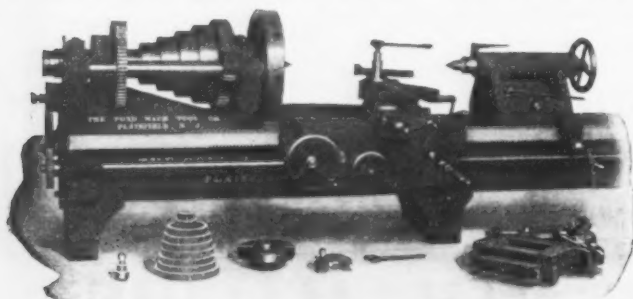
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POND LATHES.

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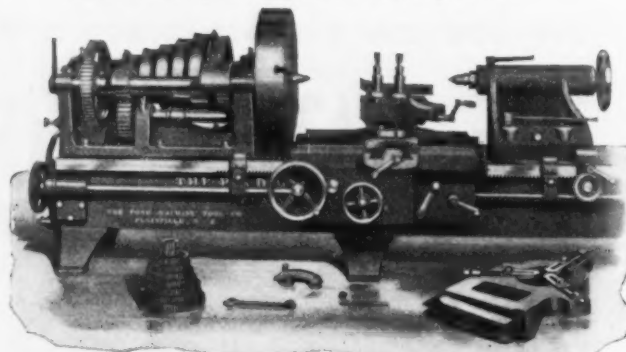
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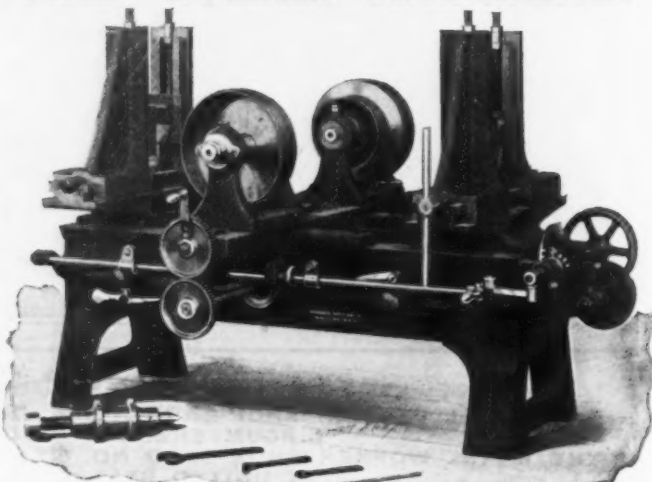
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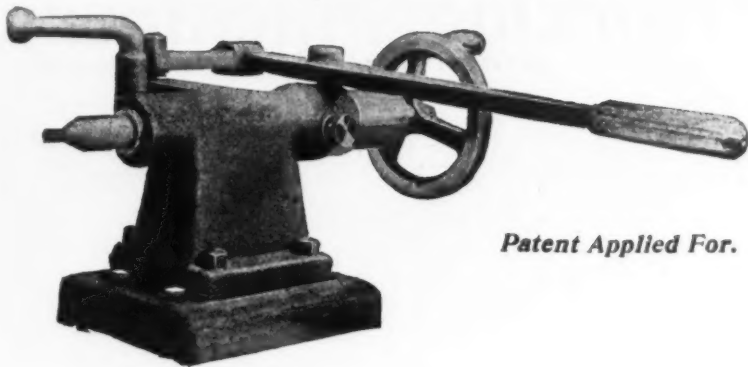
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SPEED LATHES



Patent Applied For.

Always in Line.

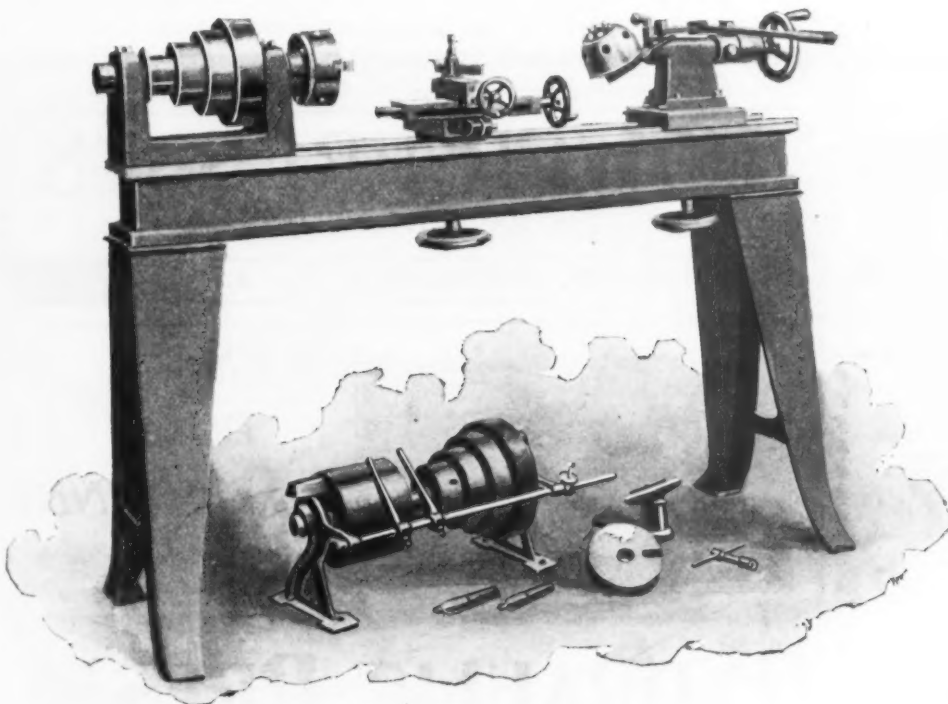
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***Moderate
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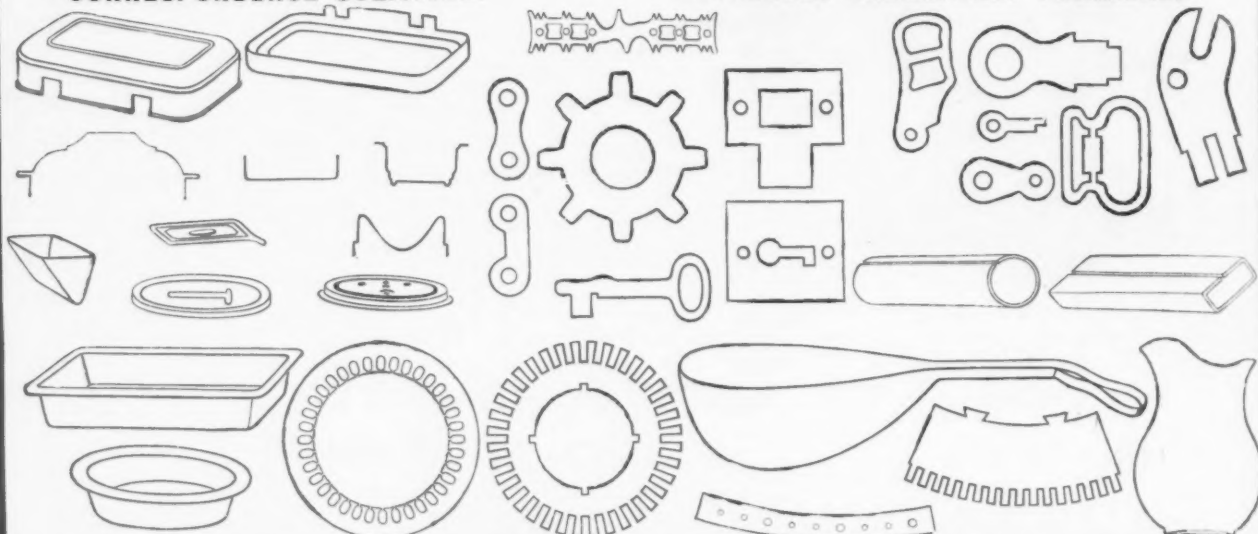
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CORRESPONDENCE SOLICITED.

ESTIMATES CHEERFULLY FURNISHED.



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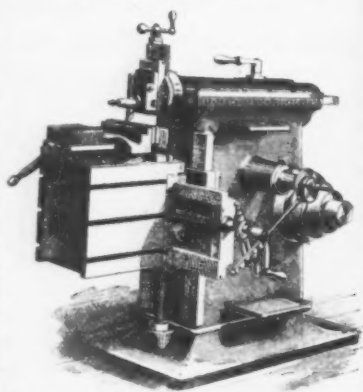
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Engine Lathes, 18 in., 22 in., 24 in.

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40,000-lb. Oil Press built in January, 1900.

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Cold Spring-on-Hudson, N. Y.

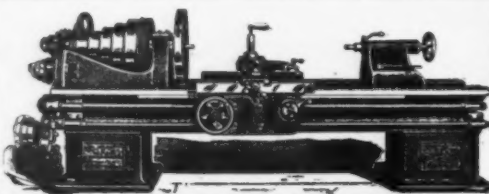
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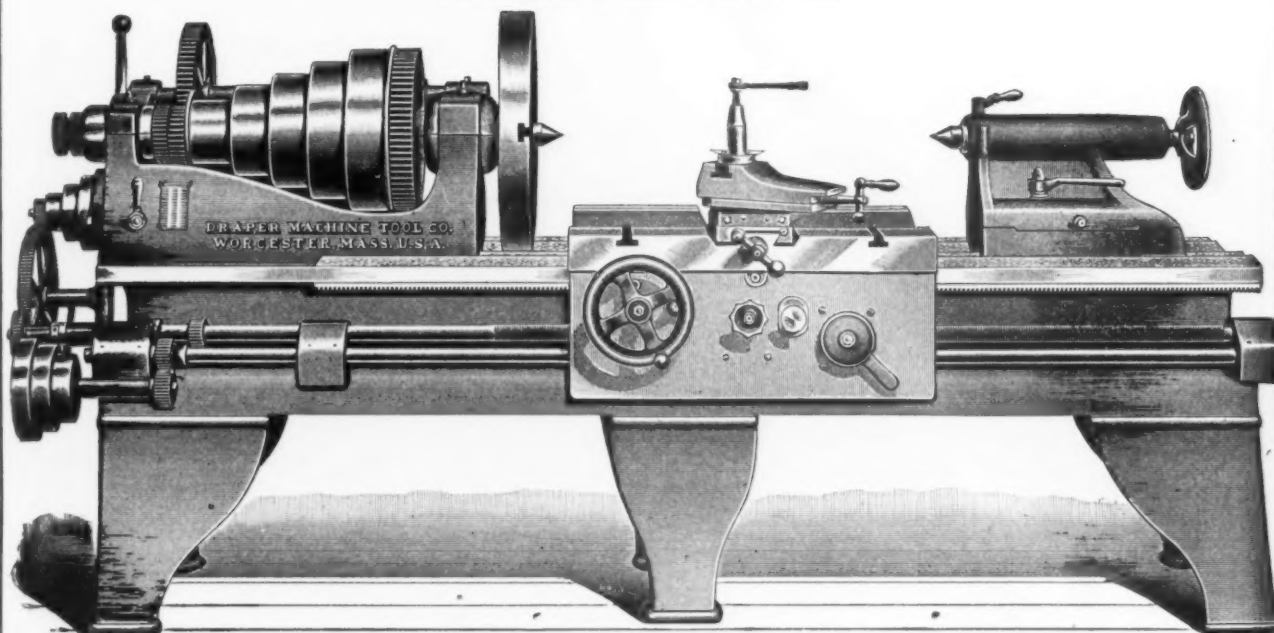
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22 in. x 10 ft. SCREW-CUTTING LATHE,

WITH COMPOUND POWER CROSS FEED REST: $1\frac{3}{4}$ in. HOLE IN SPINDLE.

SHIPPING WEIGHT, 4170 Lbs.



Hand Lathes, Chucking Lathes, Screw Machines, 72 in. Boring Mill,
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The next size, 23 in. Swing, is about ready for delivery. We shall be glad to send you printed matter.

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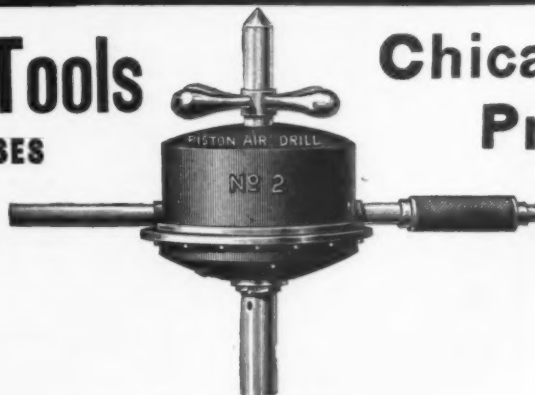
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Will drill or ream in iron and steel up to 3 inches in diameter.

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NEW YORK OFFICE,

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The New Haven 10-Inch Stroke Slotter

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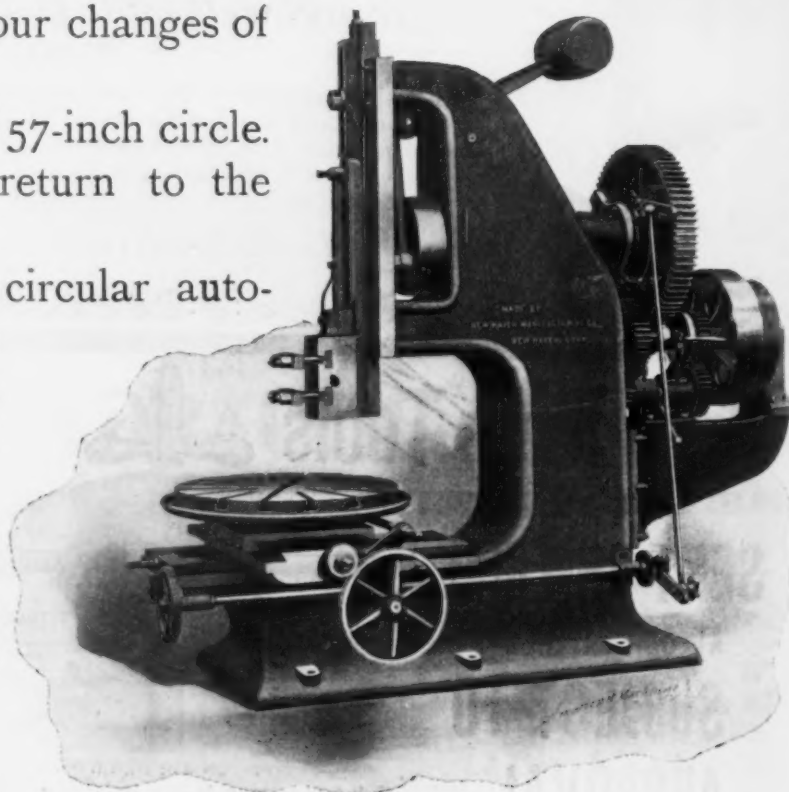
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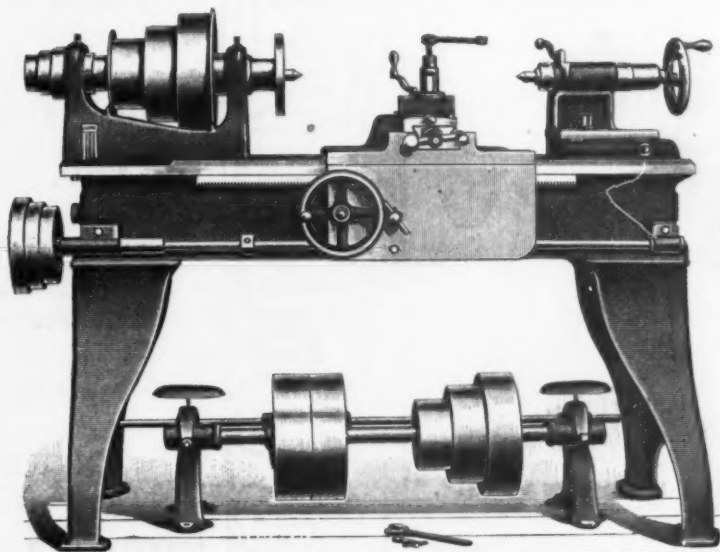
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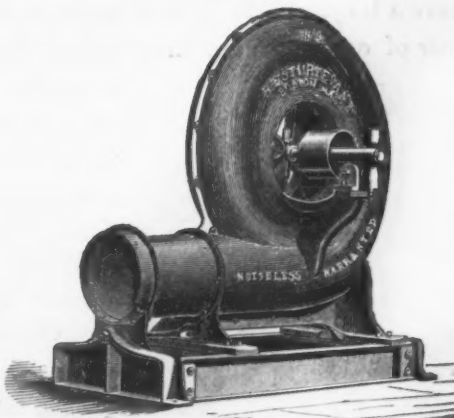
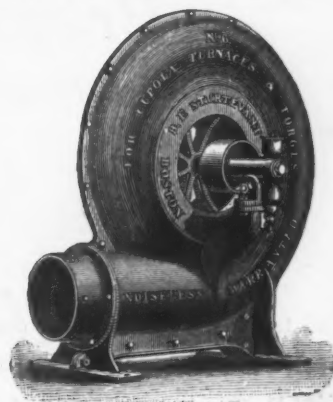
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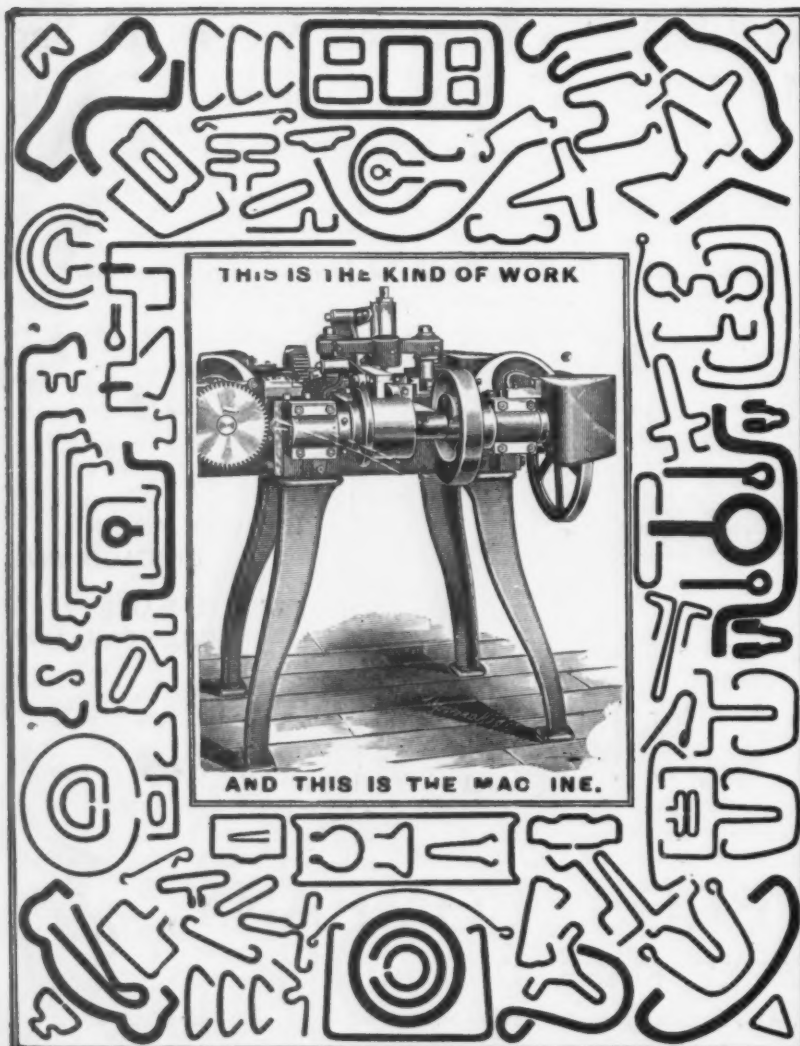
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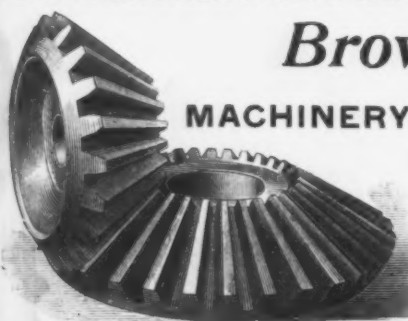
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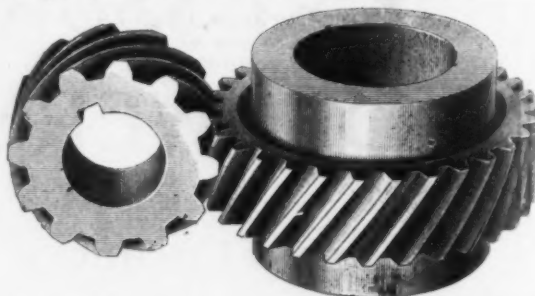
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2d-HAND FEED WATER HEATERS.

Largest stock in America. Will be sold at bargain. These heaters are mostly taken in exchange for our improved Berryman (Keller's Patent), "A Little Giant," cast, superior to all other feed water heaters, both as to results and durability.

BENJ. F. KELLEY & SON, 91 Liberty St., N. Y.

LIGHT PLANT FOR SALE.

Two 35 H. P. Fischer C. C. high speed, self going engines, with two 40 incandescent light 7500 watt dynamo with switchboard

W. J. CARLIN COMPANY,
 610-611 Lewis Bldg., Pittsburgh, Pa.

NEW YORK OFFICE: 514-515 Park Row Bldg., New York, N. Y.

ENGINES AND BOILERS.

12 x 36 Lane & Bodley Corliss
 14 x 15 Phoenix automatic
 7 x 7 Payne
 14 x 30 t. m.
 11 x 30 Fitchburg
 18 x 26 Buckeye

Engines.

and others second hand. Also
 2 44 x 18 Hor. Tubular Boilers.

Send for complete list of second-hand machinery.
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New and Second-Hand Machinery in Stock.

38 x 28 Field lathe, gd. lathe, new.
 44 x 26 Field ditto, new.
 42 x 18 & 18 ft. Lodge & Shipley ditto, new.
 38 x 23 ft. Fisa triple grd. ditto, new.
 36 x 14 ft. Fisa ditto, new.
 32 x 18 & 22 ft. Fay & Cott lathe, new.
 21 1/2 x 12, 14 & 6 ft. Davis lathe, new.
 20 x 14 & 16 ft. Lodge & Shipley lathe, new.
 25 x 0, 12 & 16 ft. Davis lathe, new.
 26 x 14 ft. trip gd. lathe, C. R. good order.
 40 1/2 x 17 ft. in. I. Johnson lathe, fine order.
 36 x 16 ft. in. Pond lathe, good order.
 72 in. Bickford vert. bor. mill, 2 hds., new.
 60 in. Bickford ditto, 2 hds., new.
 43 in. Rogers & Hemphill ditto, 2 hds., new.
 12 ft. Knowlton vertical boring and turning mill, good as new.
 60 in. Wm. Sellers & Co.'s ditto, 2 hds., good order.
 4 in. bar 8 ft. table, Newark Floriz boring and drilling machine, power lift, new.
 56 x 14 Nicholson & Aternan ditto, new.
 61 x 60 x 24 ft. Wm. Sellers & Co.'s planer, fine order.
 39 x 80 x 10 Harrington planer, good order.
 54 x 48 x 12 ft. L. W. Pond planer, 2 hds., new.
 42 x 36 x 12 Cincinnati ditto, 2 hds., new.
 33 x 34 x 10 Cincinnati ditto, new.
 30 x 30 x 14 ft. Cincinnati ditto, new.
 30 x 27 x 9 Rock ester ditto, new.
 22 x 22 x 5 L. W. Pond ditto, new.
 No. 36 ft. arm Bickford plain radial drill, new.
 No. 25 ft. arm Bickford tapping radial drill, new.
 236 in. Cincinnati upright mills, H.G. & P.F., new.
 Pratt & Whitney special 4 spindle double hd. milling machine—practically new.
 No. 12 and No. 13 B. & S. plain millers, fine order.
 2 No. 6 Brin'd plan mill's with cutters, good as new.
 20 ft. hydraulic ship keel bending mach., fine order.
 Cincinnati planer and uni-miller, all sizes, new.
 Protiss patent swappers, 12 to 32 in stroke, inclusive, new.
 Also large assorted stock of other tools. Send for complete list.

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 115 Liberty St., New York, N. Y.
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Chucking Machines

Pl. in and Friction Heads.

5 1/4 in. plain, 1 5/8 hollow spindle.
 1 1/4 in. friction geared, 1 1/4 hollow spindle.
 2 1/8 in. " " 1 5/8 hollow spindle.
 3 1/8 in. " " 1 3/4 " " "
 Pratt & Whitney make. Condition A1.

A. B. Pitkin Machinery Co.,
 PROVIDENCE, R. I.

SECOND-HAND BOILERS AND ENGINES

For Immediate Delivery.

150 in. x 12 ft. Woodbury Boiler, 58 3-in. tubes, no dome, half arch front and fixtures except stack, good order.
 246 in. x 13 ft. Syracuse Boilers, 46 3-in. tubes, no dome, full front, usual fixtures except stack, fair order.
 133 in. x 8 ft. Woodbury Boiler, 15 3-in. tubes, no dome, half arch front, no stack, good order.
 128 in. x 12 ft. Erie Boiler, 32 3-in. tubes, dome, 36 in. x 28 in. half arch front, first-class order.
 142 in. x 12 ft. Horizontal Boiler, 40 3-in. tubes, dome 22 in. x 24 in., half arch front, fine order.
 130 in. x 7 ft. Watertown Portable Boiler, 22 3-in. tubes, cast iron dome, nearly new.
 17 ft. P. Vertical Boiler, good as new.
 14 1/2 x 5 Payne Automatic Vertical Engine, first-class order.
 16 H. P. Vertical Engine, in strictly first-class order.
 15 H. P. Troy Vertical Engine and Boiler, nearly new.
 15 H. P. Erie Vertical Boiler, in fair order.

All of the above boilers and engines have been thoroughly overhauled and put in first-class running order. For further information write.

THE W. P. DAVIS MACHINE CO.,
 126, 128, 130 Mill St.,
 ROCHESTER, N. Y.

FOR SALE—Engines and Boilers.

For sale of new and second hand portable, stationary and vertical steam engines and boilers constantly on hand.
 W. J. CARLIN & CO., N. Y.
 New York Office, 514-515 Park Row Bldg., New York, N. Y.

ENGINES.

Immediate Delivery.

1 1/2 x 18 Ideal.
 2 1/2 x 18 McIntosh & Seymour.
 1 1/2 x 15 " "
 2 1/2 x 4 Ideal.
 1 1/2 x 20 x 14 Ideal Tandem Compound.
 2 1/2 x 12 Ideal.
 1 1/2 x 10 Ideal.
 1 1/2 x 8 Vertical.

1 000 H. P. Austin Open Hot Water Heater.
 2 7/8 x 5 x 6 Worthington Duplex Feed Pumps.

Any of the above can be inspected and delivered at any time.

We have a large stock of Dynamos, Boilers, Pumps and miscellaneous machinery. Write us for details and lowest prices.

ILLINOIS MAINTENANCE COMPANY,

Edwin H. Cheney, Mgr.

1625-204 Dearborn St., Chicago, Ill.

FOR SALE.

42 inch Schellenback Pulley Lathe,
 Bores and turns simultaneously.

Portions of three shops for sale.

Write us your wants.

J. B. DOAN & CO.,

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For Immediate Delivery.

Engine Lathes, 10 in. to 32 in. swing.
 Speed Lathes, 10 in. to 30 in. swing.
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 Planers 20 in. to 34 in.
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 Milling Machines Hand and Power.
 Screw Machines and Monitor Lathes up to 20 in. feed and Power Presses, a variety of sizes.
 Drop Hammers with and without automatic lifts.
 Hurlburt & Rogers Cutting off Machines.
 Send for catalogue of Presses.

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HOISTING ENGINES.

19 New and second-hand Steam and Electric Hoists 8 to 125 H. P., electric hoists.
 32 Horizontal, Vertical and Portable Boilers, new and second-hand, 125 H. P. and smaller.
 19 Horizontal and Vertical new and second-hand Slide Valve and Automatic Steam Engines.
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 4 Pair Coupled Vertical Engines, 5 in. to 12 in. cylinders.
 20 New and second-hand Steam Pumps.
 9 Vertical and Horizontal Centrifugal Pumps, new and second-hand.
 2 1/2 ton Steam Road Rollers.
 1 Small Air Compressor.
 1 225 lb. Steam Hammer.
 Lot Derricks, Pile Hammers, Rails, Cars, etc.

CARLIN MACHINERY & SUPPLY CO.,

Jno. H. Carlin, Prop.,

101-109 (Old 186) Lacock St., Allegheny, Pa.

FOR SALE—BARGAINS.

NOTE REDUCTIONS.

"Crosby" 2 column screw Press, heavy.....\$60
 50 H. Horizontal, tubular Boiler, guaranteed.....25
 30 H. Austin, Feed Water Heater.....12
 40 H. "Receiving Tank" 50 lb. test.....60
 16 in. "Huyett & Smith" Ventilating Fan.....40
 10 H. "pright" (dr) rank Engine new.....20
 15 H. submerged Plug "pright" Boiler.....20
 No. 1 "turbovent" blower, new.....25
 Pendaum 200 lb. Press.....25
 Slide cut-off Valve and back.....25
 15 in. "pright" Drill Press.....15
 2 1/2 in. x 30 in. x 14 ft. iron planer, not comp. etc.....80
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 10 H. "Erie" "ty" "pright" Boiler complete.....75
 15 H. "pright" Boiler, complete with fittings.....90
 "Diamond" Emergency grinder.....12
 4 ft. x 1/2 in. Planer, buck, heavy.....15
 Send for discounts.

PARADOX MACHINERY CO.,

181 E. Division St., Chicago.

SPECIAL BARGAINS

SECOND-HAND TOOLS.

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1 1/2 x 5 Prentice Bros.
 1 1/2 x 6 Prentice Bros.
 3 1/2 x 6 "Pencer" sp. ed.
 1 1/4 x 4 ft. 6 in. Putnam.
 1 1/4 x 5 Putnam.
 2 1/4 x 6 Putnam.
 1 1/2 x 6 Pratt & Whitney.
 1 1/2 x 6 Br. wh.
 1 1/2 x 6 Harrington.
 1 1/2 x 6 Somerset.
 1 1/2 x 5 Wm. Gleason.
 1 1/2 x 6 Fuller.
 1 1/2 x 6 McManon.
 2 1/2 x 6 Pratt & W., plain.
 1 1/2 x 7 Pratt & W., plain.
 1 1/2 x 8 Pratt & W.
 1 1/2 x 10 Am. T. & M. Co.
 1 1/2 x 12 Reed.
 1 1/2 x 7 Pratt & W., plain.
 2 1/2 x 8 McMahon.
 2 1/2 x 8 Stover.
 1 1/2 x 6 Bullard.
 3 1/2 x 10 "Wright" Chucking.
 1 1/2 x 8 Dustin & Hubbard.
 1 1/2 x 12 Lahe & Morse.
 1 1/2 x 17 Pond.
 1 1/2 x 11 Pond.
 1 1/2 x 19 Fr. eland.
 1 1/2 x 16 Fr. eland.
 1 1/2 in. Single Axle Lathe

PLANERS.

1 24 x 24 x 6 Putnam.
 1 26 x 26 x 5 "Y.S. Fuz. Co.
 1 60 x 60 x 20 Fitchburg.
 1 14 ft. 6 in. Sellers Plate Planer.

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1 3-spindle Ames.
 1 3-spindle Garvin.
 1 3-spindle W. & Rogers.
 1 20 in. "pright" lever feed.
 1 25 in. Weeks & Halsey.
 1 39 in. New Haven.
 1 cement & D. Wright.

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1 19 in. Crank, Remont.
 1 25 in. fric. Hendey.
 1 12 in. rank, Prentiss.
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 Branches at Chicago Pittsburgh and Cleveland.

FOR SALE—BAR MILL.

12 in. 3-high Bar Mill.
 9-in. 3-high Bar Mill.
 12-in. Cold Rolling Mill.
 Corliss Engines coupled direct to trains.
 Tubular and Waste-heat Boilers.
 Heating Furnaces.
 Screens, saws, Cooling and Straightening Beds, etc.
 5 acres of ground.
 Building, 237 x 121 ft.
 Brick Building for additions 360 x 80 ft.
 Connections with four railroads.
 Above plant is located in thriving Ohio town.
 W. J. CARLIN & CO. N. Y.
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 NEW YORK OFFICE:
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FOR SALE.

A Complete Set of Blind Making Machinery.
 1 Bash and Door Sticker.
 1 Bash and Door Tenator.
 1 Door ander.
 1 Wash Workster.
 1 Bash and Door Squeezer.
 1 Two Spindle Shaper.
 1 Moulding Sticker.
 Several hundred moulding knives.
 1 10 H. P. West-house Engine.
 1 30 H. P. Stationary Engine and Boiler.
 1 40 H. P. Stationary Boiler.
 1 80 H. P.
 1 50 H. P. Portable.
 1 30 H. P.
 1 6 H. P.
 1 25 H. P. Motor.
 1 25 H. P.
 1 14 H. P.
 1 Blacksmith Bolt Header with new set of dies.
 1 D. K. Dederick Perpetual Bailing Press, as good as new.
 3 Enslage Cutters.
 Write for prices. All of above will be sold cheap for cash.
 F. R. PATCH MFG. CO., Rutland, Vt.

FOR SALE.

74 in. Gate Shear.
 LONG & ALLSTATTER.
 In Fine Condition. Practically New.
 Address "P. G.," care The Iron Age, N. Y.

WANTED.

One good second-hand 24 in. to 28 in. back geared and power, feed, sliding bed Drill Press. Send full description and quote best price. Address
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Are offered by J. H. Hillman & Son, Empire Building, Pittsburg, Pa., in the following first class properties:

BLAST FURNACES IN PENNSYLVANIA.

No. 1, capacity 900 tons daily, now running, making over \$5 per ton profit. Can be turned over promptly. Will pay half the cost this year.
No. 2, capacity 200 tons daily, now running with big profit.

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Ready for operation August 1st.

TWO HUNDRED COKE OVENS AND Five Thousand Acres of Coal Lands in West Virginia.

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EIGHTY COKE OVENS AND CONNELLSVILLE coal in Connelville region.

FIFTY THOUSAND ACRES OF COKE-ing coal adjoining Connelville region. Nine foot vein in Fayette and Greene Counties, Pa. These lands offer the best investments now before the American public.

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Capacity 2500 tons per annum. Now shipping East and West. Modern electric equipment. Coal is like Pocahontas smokeless used in the United States Navy. Being exported.

FIFTY THOUSAND ACRES OF KENTUCKY Coal and Timber Land At a low price.

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With well-developed ore mines and millions of tons of ore in sight and has also a large number of farms on the Cumberland and Tennessee Rivers. This property contains 40,000 acres and is a principal in itself.

MANUFACTURING PROPERTY IN the Monongahela Valley.

THICK VEIN COAL IN THE Monongahela Valley.

In the 3d, 4th, 5th, 6th and 7th pools of the Monongahela River.

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In tracts of five, ten, twelve and seventeen thousand acres each, are cheap and are being sold rapidly to Eastern capitalists.

MANUFACTURING SITE AND COAL Lands on the Allegheny River.

On the Allegheny Valley Railroad is splendid property capable of prompt development.

CANADIAN IRON ORE MINES IN Operation.

A MODERN ROLLING MILL.

MANUFACTURING PROPERTIES and sites in Pittsburg and Allegheny Cities, Pa.

FIFTEEN THOUSAND ACRES OF coal in Centre and Clinton Counties, Pa. on the Beech Creek Railroad, suitable for shipment East.

TEN THOUSAND ACRES OF COAL on the main line of the Pennsylvania Railroad, containing four veins of coal, mostly above water. John Fulton, Mining Engineer of Johnstown, Pa., estimates over 80,000,000 tons of coal on this property. Will be sold cheap to a prompt buyer.

A FIRST-CLASS CHARCOAL BLAST Furnace.

For full information address

J. H. HILLMAN & SON,
Empire Building,
PITTSBURG, PA.

For Sale.

Pair 14 x 36 Harris-Corliss; 24 x 36 Watts-Campbell; 18 x 12 and 2 1/2 x 12 New York safety. 100 K W M P. 3800, 500 300, 50 50 light dynamo 2 1/2 H P crane motors, speed 300 1 H P. 250 volt motor, slow speed. 4 Sturtevant exhausters, 1 Buffalo blower. Steam shovel, hoisting engines, crushers, coal mining machinery and contractors' equipment. SEND DESCRIPTION any machinery wanted or for sale.

CHESLEY MACHINERY CO., Havemeyer Bldg., N. Y.

CUPOLAS, CRANES, LADLES BLOWERS,

and all other Foundry Equipment, new and second-hand. Send us list of your wants.

THE J. D. SMITH FOUNDRY SUPPLY COMPANY,
CINCINNATI, O.

AUTOMATICS.

Five 2 1/2 in. Cleveland Automatic Screw Machines, used less than twelve months. In first-class condition.

GEAR CUTTER.

50 in. Gould & Eberhardt Full Automatic, cuts spurs, bevels and worms, complete with pump, pan and usual features.

MILLING MACHINE.

No. 3 Cincinnati Universal, Automatic feeds in all directions.

42 in. Bullard Turret Boring Mill, Screw Cutting.

Marshall & Huschalt Machinery Co.,
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19 S. Water St., Cleveland, O.

510 Johnson Bldg., Cincinnati, O.

PARTIAL LIST OF Second-hand Machinery IN STOCK.

1 80 H. P. 60 in. x 16 ft. Tubular Roller.
2 125 H. P. 66 x 18 Tubular Rollers.
1 100 H. P. Locomotive Boiler.
1 100 H. P. Baker Automatic 14 x 20.
1 100 H. P. Atlas Automatic Engine.
1 150 Buckeye Automatic Engine, size 16 x 18.
1 125 Buckeye Automatic Engine, size 14 x 16.
1 100 H. P. Hill Automatic Engine, size 3 x 12.
1 No. 12 Morris Centrifugal Sand Pump, direct connected to 2 in. vertical engine.
2 No. 6 Morris Centrifugal Sand Pumps.
1 16 x 0 x 0 Worthington Duplex Pump.
1 12 x 2 x 0 Worthington Duplex Pump.
1 12 x 4 x 0 Worthington Duplex Pump.
1 Deane Duplex Power Pump, 5 in. plungers.

RAINIER & WILLIAMS,

64 So. Canal Street, Chicago, Ill.

Corliss Engines For Sale.

2 34 x 60 Horizontal Engines, one right hand and one left hand. These engines are now coupled to one shaft, but would furnish with fly wheel or band wheel to suit each separately.
1 24 x 56 Horizontal Engine with 30 ft. band wheel.

W. J. CARLIN COMPANY,

610-611 Lewis Bldg., Pittsburg, Pa.

NEW YORK OFFICE:

514-515 Park Row Bldg. New York, N. Y.

2d-Hand Machinery Bargains.

One 18 in. x 42 in. Watts Campbell and 2 1/2 in. x 42 in. Wright Corliss Engines. High Speed Automatic Simple Compound Condensing and Slide Valve Engines; also Boiling Engines, Boilers, Heaters, Pumps Vacuum and Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.

CHAS. BENTON,

72 Trinity Place, N. Y.

FOR SALE.

3 Steam Fire Engines, very cheap.

WALSH'S SONS & CO., Newark, N. J.

BLOOMING MILL FOR SALE.

One 32 in. Reversing Blooming Mill with pair of 28 x 48 in. engines; also live tables, table engines, hydraulic manipulator, etc., built by Macintosh, Hemphill & Co.

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NEW YORK OFFICE:

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FOR SALE.

Elevator Stop and Lock Patent.

Elevator Gate and Bar Patent.

Send for our list of patents

P. O. BOX 224, Boston, Mass.

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McDowell, Stocker & Co.,
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On hand for immediate delivery, large and well assorted stock of both new and second-hand machinery. New list just issued. Ask for one. Send US your inquiry, you will profit by it.

McDowell, Stocker & Co.,
59-61 So. Canal St.,
CHICAGO.

For Quick Delivery.

Single Punches and Shears,

48 in. throat, 1 1/4 in. in 3/4 in.

36 in. throat, 1 1/4 in. in 1 in.

Splitting Shears,

For 3/4 in., and 1 1/4 in. plate.

Double Angle Shear for 4 x 4 x 3/4 in. angles.

Plate edge Beveling Shear for 3/4 in. plate.

Gate Shear and Multiple Punch, 78 in.

Bending Rolls, 12 ft. 2 in. between housings,

100 in. bet. hags. for 1 1/4 in. plate.

Spacing Table, hand, 8 ft.

Radial Drills, 48 in. and 60 in. arm.

Boiler Makers' Flanging Clamps, 10 ft.

Steam Riveter, 6 1/4 ft. gap.

Duplex Vertical Engines, 9 x 9.

Plate Planer, 6 ft. cut.

HILLE & JONES COMPANY,
Wilmington, Delaware.

Engine Bargains.

130 in. x 60 in. R. H. Hamilton Corliss, 15 in. shaft;
18 ft. fly wheel in 8 sections; rim 12 in. x 15 1/2 in.

18 in. x 32 in. Single Cylinder Link motion Double
Drum with friction and brake band Haul-
age Engine, made by Webster, Camp & Lane.
The above engines are in A No. 1 condition.
For Sale by

WM. C. JOHNSON & SONS MACH'Y CO.,
St. Louis, Mo.

FOR SALE.

Machine Tools In Experimental Shop.

One 10 in. x 5 ft. Young Lathe, Compound Rest.

One 14 in. x 6 ft. Porter Lathe, Compound Rest.

One 18 in. x 8 ft. Oakland Lathe, Compound Rest.

One 18 in. Ohio Crank Motion Shaper.

One 20 in. Lodge & Davis Shaper.

One Brainard Plain Milling Machine, Automatic Feed.

One 30 in. Pond Style Pulley Lathe.

Two No. 2 Wire Screw Feed Machines, 15-16 capacity.

One set 6 ft. Boiler Bending Rolls.

30 in. Drill complete, auto feed.

36 in. Barnes Drill, complete.

THE FAIRBANKS COMPANY,

701, 703, 705 Arch St., - Philadelphia, Pa.

FOR SALE.

One 120 H. P. Cross-compound Armstrong & Sims
Auto Engine cylinders 36 and 18 1/2 x 15.
One 12 in. x 12 in. Phoenix Auto. Engine
One 12 in. 24 in. Wetherill Corliss Engine.
One 12 in. x 36 in. Babcock and Wilcox Engine.
One 8 in. x 6 in. Atlas Auto. Engine center crank.
One 12 in. x 7 in. x 10 in. Worthington Duplex Pump.
One 1200 lb. Ferris and Miles Steam Hammer.
Also a number of smaller Engines and Pumps.

THP & H. WA. H. CO. 158 Indiana St., Chicago

CORLISS ENGINES.

1 26 x 48 Allis Corliss.

1 14 x 36 Cooper Corliss.

1 14 x 30 Frick Corliss.

LOCOMOTIVE.

1 Standard gauge, 4 driver, saddle tank
shifting engine, weight 60,000 lbs.,
fine shape, cylinders 14 x 22.

One 1-2 Yard Steam Shovel.

One McFlyler Derrick for Hoisting
Coal.

GEO. H. BOWLER,

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POWER PLANT.

We offer the following complete
power plant at a bargain:

1 14 in. x 16 in. ENGINE.

1 54 in. x 14 ft. BOILER, with
stack and fittings

1 No. 3 DEAN STEAM PUMP.

Entire plant is in first-class con-
dition and nearly new. Can be
seen running in Indiana. Write
for price.

WM. A. READE & CO.,
216-217 American Trust Bldg., Cleveland, O.

Machinery Bargains.

PLANERS.

34 x 34 x 15 ft. bed, made by Fairbanks, Provi-
dence, R. I. Price, \$500.00.

LATHEES.

Two 16 in. swing, 6 ft. bed, made by Putnam.
Price, \$125.00

One 15 in. swing, 6 ft. bed, made by Wood &
Light. Price, \$125.00.

Two 18 in. swing, 8 ft. bed, made by Campbell &
Gage, Watford, N. Y. Price, \$125.00.

One 17 in. swing, 8 ft. bed, made by Campbell &
Gage, Watford, N. Y. Price, \$125.00.

One double head lathe, 32 in. swing, 30 ft. bed,
made by Campbell & Gage, Watford, N. Y.
Price, \$500.00

F. O. B. cars, Philadelphia, Pa.

A. V. KAISER & CO.,
222 South Third St., Philadelphia.

Wanted to Make

We have a complete modern manu-
facturing plant near Boston, equipped
with Power Presses, Automatic Screw
Machines, Nickel Plating and Polishing
Plant and want to correspond with
parties having articles that can be made
in such a factory. Address

"W."

care The Iron Age, 70 Kilby Street
Boston, Mass.

FOR SALE.

One 30 H. P. Tubular Boiler, 1 10 H. P. Tubular, 1 10 H.
P. Upright, 1 10 H. P.
One 10 H. P. Locomotive Boiler
One 15 x 30 Hor. Engine 10 ft. x 16 in. Balance Wheel
One 11 x 20 " " 7 ft. x 14 in. " "
One 9 x 18 " " 6 ft. x 12 in. " "
One 10 1/2 x 12 Centre Crank Arlington & Sims
Wheel Governor, two 5 ft. x 10 in. balance wheels.
One 6 x 10 Centre Crank Engine.
Write for prices.

HANNAN & FINTON, Springfield, Mass.

WANTED.

A well established machine tool shop, located on
the Rhine, Germany, desires the services of a first-
class, experienced constructing engineer, one
familiar with the designing and construction of
hydraulic machinery adapted to ship-building.
Position permanent to the right man one conversant
with the German language preferred. State
salary and reference, addressing "ENGINEER,"
care The Iron Age, 20-22 Pickering Bldg., Cincin-
nati, Ohio.

FOR SALE. AT A BARGAIN.

1 Second hand Corliss Engine, 14 in. x 42 in.
1 Blake Stone Crusher, 15 x 9 with screen.
1 Dean Duplex Steam Pump, 5 x 3 1/2 x 5.
3 Edson Diaphragm Pumps.

WM FLINTOFF, Haverhill St., Boston.

FOUNDRYMEN.

We have for sale a complete Foundry
for making Stoves. Will sell whole or part.

The Thomas & Lowe Machinery Co.,
Providence, R. I.

WANTED.

To correspond with an expert shovel maker,
looking to the establishment of new factory at
Birmingham, Ala. J. R. P. DUNHAM,
Birmingham, Ala.

Machinery Bargains.

24 x 48 Hamilton Corliss Engine.
24 x 24 1/2 Safford Engine.
14 x 42 Allis Corliss Engine.
14 x 30 Cummer 4 valve Automatic Engine.
14 x 14 Sutton Marine Engine.
Two 12 x 11 and one 9 x 9 Westinghouse Engine.
11 x 11 Ide Vertical Engine.
8 x 16 H. P. Automatic Engine.
60 H. P. Rowe Feed Water Heater.
200 H. P. Berryman Heater.
200 H. P. Reynolds Heater.
200 H. P. Stillwell-Bierce Heater.
70 H. P. Otis Steel Fire Box Boilers.
75 feet Double Leather Belt, 23 in.
90 H. P. Waste Heat, Vertical Boiler.

The above are all in first class condition and
ready for shipment.

A. L. DAWSON & CO.,
27-31 W. Washington St. Chicago, Ill.

John P. Lovell Factory to be Sold.

By F. O. BAILEY & CO., Auctioneers,
Portland, Me.

Important Auction Sale of the John P. Lovell
Co. Factory, Machinery, Tools, etc., at South
Portland, Maine.

By order of assignees we shall sell on Tuesday,
August 4th at 10 a.m. on the premises, the val-
uable property known as the John P. Lovell fac-
tories, situated at South Portland, Me. The prop-
erty consists of a lot of land of about five acres,
is situated on Portland Harbor, by electric cars
within ten minutes of Portland. On the property
is a large brick mill, 220 ft. long by 83 ft. wide,
with cemented floor; also adjoining mills 150 x 47
and one 90 x 40, two stories, built of wood. Brick
mill was built in 1893; wooden mills in 1898. Fac-
tory is equipped with an automatic sprinkler system,
large and convenient boiler house with 5 horse
power boiler and 185 horse power Back Eye engine,
both of which are in first class condition. Mill is
also equipped throughout with shafting and piped
for heating. This valuable property is finely
located, and a desirable property for most any
manufacturing business. Immediately following
the sale of real estate will be offered the entire
fixtures, machinery and personal property of the
factories, in lots to suit. The machines and
tools are up to date and very desirable. A de-
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No. 5 Bardons & Oliver Screw Machine, good as new,
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16 1/2 x 32 Allis Corliss, box bed type; right hand, 16
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1 35 H. P. Upright Boiler with cast iron base, in
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TELEPHONES 2440, 2441 AND 2442 BROAD.
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Steel and Iron Scrap for Open-Hearth Furnaces Bought and Sold.
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- Very fine steel self-supporting stack, 64 in. diam., 100 ft. high, with cast iron, ornamental top and ladder.

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- 1 Portable Saw Mill, complete.
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A foundry plant in complete operation, employing 40 men, and doing a large and profitable business, making a line of staple specialties, sales of which can be increased to almost any extent. The plant is situated in an island city in a central Western State and railroad facilities are exceptionally good. The owner wishes to retire. This is a splendid opportunity for a good practical foundry man with some capital; or a partnership could be formed with the practical men in charge of the different departments. Address

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A new wheel made in halves, 30 ft. in diameter, 50 inches face, turned for belt, bored 15 inches, weight 4,500 lbs.
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One Vertical Engine 14 x 14, roughtry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12 Engine.

Also a large lot of iron tanks.

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- Planing Dynamos from 300 to 700 gallons capacity.
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NEW.

Engine Lathes 12 in. to 34 in. Swing, various lengths of bed.
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Nos. 1, 2 and 3 Cincinnati Full Univ. Milling Machs.
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36 x 36 x 12 ft. Gray Planer with two heads.

Write us for any machinery wanted, or what you may wish to exchange or sell.

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18 x 42 Corliss Engine in A1 condition, also 80 H. P. New Era Gas Engine in excellent condition, which has been running only six months. Both ready for delivery about Oct. 1st. Can be seen during working hours. Apply

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One "Sturtevant" Blower, No. 8.

One do. do. No. 5.

Two Horizontal Tubular Boilers, 66 in. x 16 ft. with 90 three-inch tubes, now running under 80 lbs. pressure.

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NEW CORNELL BLOWERS—Poole's patent, all sizes—the best in the market—send for prices.

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Tools lately in use in Boiler Manuf'g Plant.

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- 35 lbs. Steel T. Rails, El Paso, Tex., delivery.
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- 350 tons of new 25 to 45 lbs. steel T. Rails, Chicago delivery.

Material subject to inspection at points of shipment.

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Each of two spans 124 feet, with a draw span of 550 feet and 200 feet, the are railroad bridges, comparatively new; were taken out because too light for new heavy rolling stock. Will make splendid wagon bridges. Will sell all together or separate spans; terms to suit.

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**Angles, Beams,
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5000 tons in stock. Moderate prices. Send for stock sheet and quotations.

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Send full description of material with lowest cash price, Phila. delivery.

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All material in 50-ft. lengths or cut to specified lengths if desired. Send for retail stock list.
All material in stock, and will be shipped immediately on receipt of order.

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**STEEL OR IRON,
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Angles Up To Four Inch.

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RELAYING RAILS.

125 Tons 50 lb. Steel.
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All Extra Fine.

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23,000 feet 20 in. Cast Iron Water Pipe made by H. D. Wood & Co., 70 lbs. to foot, in 12 ft. lengths in first class condition for re-use.

Will be sold in lots to suit.

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4000 tons 56 lb. steel relaying rails with splice bars located in West Virginia.

1500 tons 66 lb. steel relaying rails with angle bars f.o.b. cars Chicago, East St. Louis or Kansas City.

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Several locomotives, standard and narrow gauge.

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Considering the slump in the market we are always ready to buy for cash.

Relaying Rails always on hand.

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150 tons 56 lb. Steel with Angle Bars.
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All Southern delivery.
New and second hand Freight Cars.

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140 tons 35-lb. Steel, with splices.
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Cut to lengths and drilled at our own plant.

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Write us when you have Scrap to dispose of or want to buy.

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Address "METAL WHEEL,"

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ENGINES, SLIDE VALVE.

1 Pair Twin 12 x 18 McCune.

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1 12 x 20 Atlas.

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1 72 x 16, 3½ in. flues.

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2 12 in. hoists, 24 ft. long, with couplings.

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Tubing, Rods and Oil Well Casing.

Second-hand Flues, all sizes, cleaned and cut to length.

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Special Tools and Machinery De-
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Direct Current, 110 Volts.

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Second Hand Machine Tools, Etc.

Two ten stamp belt driven Atmospheric Stamps.
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Three Logging Locomotives.
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Geared Die cutting Power Press, plates 20 x 36.
Bliss Drop Press, 17¼ in. bet. uprights, 500 lb. Hammer.
12 " " " 300 " "

Both have Peck automatic lifts.
2 deep throat Power Presses, 1½ in. throw, 30 lb.
Wheels.

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12 Foot Presses, large beds and opening in beds.
18 " " weighted compound levers.

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15 Open Front Screw Presses and many others.

AN ENGLISH SPOT CASE FIRM will be glad to
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One large Tumbling Barrel for cleaning cast-
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Address with description and lowest price.

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 Two 18 in. x 36 in. Allis Corliss, Hor., Simple Engines.
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Three Horizontal Tubular, 66 in. x 15 ft., boilers.
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 Three Horizontal Tubular, 60 in. x 16 ft., Boilers.
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 One Horizontal Tubular, 36 in. x 12 ft., Boiler.
 Send for our complete stock list.
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Estimates for the manufacture of a novelty in cast iron or similar metal. For particulars address in writing

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FOUNDRY WANTED,

With or without cupola and blower; floor space for actual molding not less than 20,000 square feet; location preferred close proximity to New York City. Address
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FOR SALE.

Two reels of 1 1/2 in. second-hand Steel Wire Rope in good condition, weighing 2 1/2 pounds per ft., containing approximately 35,000 ft. This cable was formerly used in street cable road, and no reasonable offer on the same will be refused. Correspondence solicited.

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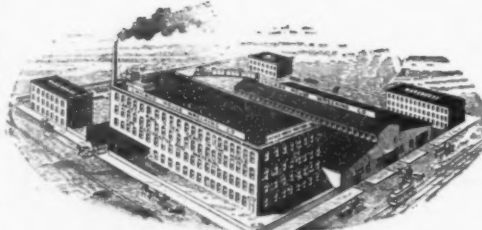
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WE HAVE OTHER BOILERS, a few of which we list in the July 26th issue of *The Iron Age*, page 91.

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No. A 45 10 x 18 center crank
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No. A 47 10 x 20 center crank
No. A 48 10 x 20 Atlas
No. A 49 10 x 18 stationary
No. A 50 10 1/2 x 18 stationary
No. A 51 11 x 12 automatic Westinghouse
No. A 52 8 x 12 pair Atlas
No. A 53 11 x 20 Atlas automatic
No. A 64 11 x 18 stationary
No. A 203 11 x 22 Rt. Hd. slide valve.
No. A 56 12 1/2 x 12 Ideal
No. A 57 12 x 12 Atlas
No. A 58 12 x 16 balance valve
No. A 202 12 x 18 Houston, Stanwood & Gamble.
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No. A 60 12 x 20 Sinker & Davis
No. A 61 12 x 20 upright
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No. A 65 12 x 20 x 14 Ball automatic compound
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No. A 71 13 x 18 four valve Russell automatic
No. A 72 13 x 20 x 15 Armstrong & Sims cross compound condensing
No. A 73 13 x 16 Erie horizontal
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No. A 75 14 x 24 Richards horizontal
No. A 76 14 x 24 box bed
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No. A 81 16 x 14 Smith, Beggs & Rankin automatic
No. A 207 16 x 36 Woodruff & Beach.

No. A 208 17 1/2 x 24 pr. auto. Williams, coupled.
No. A 82 18 x 30-250 H.P.
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No. A 84 20 x 36 Corliss
No. A 85 20 x 42 Corliss
No. A 86 20 x 48 Corliss
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No. A 94 20 H.P. Milburn
No. A 95 No. 874 Racine automatic, 9-in. stroke
No. A 96 80 H.P. Farquhar
No. A 97 No. 1 Russell high speed automatic
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No. A 103 35 H.P. upright
No. A 211 85 H.P. Chandler & Taylor.
No. A 104 40 H.P. Otto gas
No. A 105 50 H.P. Otto gas
No. A 106 19 H.P. Lewis gasoline
No. A 107 50 H.P. Raymond gasoline
No. A 172 68 H.P. Atlas
No. A 173 10 x 20 slide crank
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No. 142 1 combined Davis & Rankin 8 H.P.
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No. A 144 1 25 H.P. portable engine and boiler
No. A 145 1 10 or 12 H.P. Altman traction engine and boiler.
No. A 146 1 20 H.P. portable engine and boiler, made by Frisby & Logue
No. A 147 1 9 1/2 x 16 fire box boiler and engine
No. A 148 1 10 x 15 Baxter combined engine and boiler
No. A 149 1 8 H.P. combined
No. A 150 1 25 H.P. combined portable
No. A 151 1 hoisting engine and boiler, 6 x 12, made by Kendall & Bro.
No. A 154 1 combined locomotive boiler and engine on skids, 10 ft. over all, cyl. 5 1/2 x 12
No. A 155 1 Baxter combined engine and boiler, cyl. 7 x 6
No. A 212 6 1/2 x 9 Moneghan hoisting, double cyl. and drum.
No. A 213 10 x 11 combined boiler, 12 ft. long, 3 ft. 4 in. wide.
No. A 214 7 x 10 4 drum, A. H. D. Co. hoisting.
No. A 215 8 1/2 x 10 A. H. D. Co. hoisting.
No. A 216 7 x 10 A. H. D. Co. hoisting.
No. A 217 5 1/2 x 8 A. H. D. Co. hoisting (three outfits).
No. A 218 7 x 10 Lidgerwood hoisting.
No. A 219 7 x 10 Lidgerwood hoisting, 4 drum (two outfits).
No. A 220 5 x 8 Lidgerwood hoisting, single cyl.

STEAM PUMPS.

We have over 230 in stock—all kinds and sizes. See partial list in *Iron Age*, July 26, page 91.

LOCOMOTIVES, FLAT CARS, &c.

No. A 137 30 gondola cars, 40,000 lbs. capacity, plain drop bottom, length over all 34 ft., width over all 9 ft. 6 in.
No. A 138 1 Brooks type locomotive, No. 4 cylinder, 16 ft., stroke 26 in.
No. A 139 1 four driver saddle tank shifting locomotive, total weight 60,000 lbs.
No. A 140 1 Porter saddle tank locomotive No. 4
No. A 141 6 flat cars, capacity 40,000 lbs., weight 17,000 lbs., 33 ft. x 8 1/2 ft., in first-class condition.

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No. A 160 1 No. 8 multipolar 75 kw.

No. A 166 1 75 kw. Westinghouse motor or generator
No. A 167 1 25-light dynamo, Simpson El. S. Co.
No. A 168 3 Amer. turbine water wheels
No. A 171 1 Power & Tainter Co. 6 x 24 surface, match 14 in. wide
No. A 175 1 Gates No. 2 stone crusher
No. A 170 1 20 in. endless bed planer
No. A 180 1 large McGowan condenser, steam cyl. 8 in.
No. A 181 1 18-in. planer
No. A 182 1 Ames lathe, 8-ft. bed, 30-in. swing
No. A 183 1 lathe, 6-ft. bed, 18-in. swing
No. A 184 1 lathe, 6-ft. bed, 20-in. swing
No. A 185 1 Putnam lathe, 12-ft. bed, 24-in. swing
No. A 186 1 lathe, 6-ft. bed, 16-in. swing
No. A 187 1 Wheeler lathe, 6-ft. bed, 14-in. swing
No. A 188 1 metal lathe, 3-ft. bed, 8-in. swing
No. A 189 1 lathe, 6-ft. bed, 16-in. swing
No. A 191 1 80-in. Sturtevant blower
No. A 192 1 No. 5 Buffalo blower
No. A 193 2 No. 8 Sturtevant blowers
No. A 194 1 hand power pipe threading machine; will thread up to 5 in.
AP 77 2 Westinghouse generators, 80 k.w., 550 v.
AH 128 6 bolters or rammers, 24 in. diam.
AH 125 1 Hubbard portable bake oven.
A 221 1 hand power elevator, 4 ft. 6 in. x 5 ft.
AP 61 1 No. 3 grinding machine for heavy feed dry work.
AP 70 2 pulverizers, drum 24 x 24 in.
AP 61 1 No. 1 grinding machine for medium work
AP 61 1 No. 2 grinding machine.
AP 61 1 polishing machine, 38 in. spindle.
A 222 1 bench polishing machine, diam. of spindle, 1 to 1 1/2 in.
AP 80 1 brick making machine.
AP 78 3 double throw Westinghouse switches.
AP 78 3 lightning arresters, Westinghouse.
AP 54 1 nut tapper.
AP 54 1 screw cutting machine, 1 to 1 1/2 in.
AP 54 1 bolt bender, Oliver Bros., 1 to 1 in.
AP 54 1 No. 1 washer machine, York & Smith.
AP 54 1 bending machine, Williams, White & Co.
AP 60 2 crushers, rev. cyl. 36 in. diam., 30 in. long.
AP 68 1 No. 13 Barragawanath feed water heater.
AP 55 1 spindle milling machine, 36 x 36 x 8.
AP 55 1 spindle milling machines, 42 x 36 x 8.
AP 65 1 H.P. hoisting rig.
AH 124 1 Buffalo cupola and forge blower, No. 9
AP 100 1 scroll saw, No. 3, made by Hegan.
A 223 1 Barnes hand power rip saw, 12 in. circle saw.
A 224 1 Barnes combined machine, with bracket attachment.
A 225 1 Barnes foot power former.
A 226 1 Barnes foot power turning lathe.
A 227 1 Barnes foot power mortiser, with chisels.
A 228 1 Barnes tenoning machine.
A 229 1 30-in. Buffalo forge hot blast arrangement.
A 230 1 Diamond drill, Bullock, 1500 ft. capacity.
A 231 1 power paper slitting machine, will take roll 36 in.
A 232 1 Fay rod machine, will make round sticks over 2 in. down.
A 233 1 Andrews dry press, 3 mold brick machine.
A 234 1 24-in. Jones water wheel, 24 H.P.
A 235 1 35-in. Leffel special water wheel.
A 236 1 Levi Houston, 10-in. molder.
A 237 1 Clayton Duplex air compressor.
A 238 1 7-ton road roller, made by R. C. Pope.
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A 243 1 8-ft. shears, foot power, Niagara, cuts up to 20-in. iron.
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A 248 1 Brewer brick and tile machine, No. 7.
A 249 1 No. 7 Sturtevant blower.
A 250 3 8-in. exhaust blowers.
A 251 4 6-in. exhaust blowers.
A 252 1 16-in. diamond shavings exhaust.
A 253 1 No. 27 noiseless Boston forge blower.
A 254 1 Smith hot blast apparatus complete, No. of base, 9.
A 255 25 brand new hydraulic rams, assorted sizes.

We only advertise items in our stock. This list changes hourly. Write for anything you are in the market for.

CHICAGO WRECKING CO., West 35th and Iron Sts., CHICAGO.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

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First-class **DESIGNER** of high grade machine tools, including the larger size planers, horizontal and vertical boring mills and lathes; none but best need apply; state experience and salary required; all applications treated confidentially. The Morgan Engineering Company, Alliance, Ohio.

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A No. 1 **MACHINIST**; must be sober and steady; state age, experience and wages expected; steady work; one preferred who has experience in making dies and punches. Address "B. F. H.," care *The Iron Age*, New York.

First-class **SUPERINTENDENT** for charcoal furnace; good place for right man; write, stating salary and experience. Address "W. A. W.," care *The Iron Age*, New York.

A **BUILDERS' HARDWARE SALESMAN**, familiar with the line in all its branches; write, stating age, experience, references and salary expected. Address "T. F. C.," care *The Iron Age*, New York.

A first-class **ROLL TURNER** for a 12-inch mill; steady employment; must be sober and capable to file tools and templates. Address "Shapes," care *The Iron Age*, New York.

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Manufacturer of a well established brand of hardware desires correspondence with traveler now visiting the retail trade; also correspondence with hardware agencies in the largest cities to cater to the retailers; full particulars as to present lines carried and territory covered; references. Address "Manufacturer, No. 82," care *The Iron Age*, New York.

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FOUNDRY FOREMAN WANTED; one who is familiar with up to date foundry practice and capable of handling 50 to 100 molders; none but the very best need apply; state experience and salary expected. Address "C. 726," care *The Iron Age*, New York.

First-class, thoroughly posted hardware representative to cover Northwestern Pennsylvania for old established hardware house; in writing give towns that have been covered, full information, with names of reference, &c. Address reply to "N. W. P.," care *The Iron Age*, New York.

FOREMAN for foundry making light and medium weight iron castings; one who can produce fine work and results; state experience, salary wanted and age; an excellent opportunity for a thorough, experienced man. Address "W. I. C.," care *The Iron Age*, New York.

A first-class **FOUNDRY FOREMAN**, experienced in making large heavy castings, green and dry sand, with full knowledge of mixtures, and a hustler; competent to handle a large body of men. Address, with references and state rate of wages expected, "O. B. Box 719," care *The Iron Age*, New York.

A first-class **MECHANICAL DRAFTSMAN**; one experienced in steel mill work preferred; good wages and permanent position for the right man. Address "C. M.," 726," care *The Iron Age*, New York.

As **ASSISTANT FOREMAN** in new machine shop in the West, doing general and mill work, a first-class machine hand; one who can handle men and see that machines are worked to full capacity; also must understand latest methods and special tools. Address "F. F.," No. 726," care *The Iron Age*, New York.

FOREMAN for machine shop in New England employing 35 men; work is general machinery and repairing. Address "B. M. N.," care *The Iron Age*, New York.

By a manufacturing company in their general offices, New York City, a mechanical engineer (technical graduate preferred) as **SALESMAN** and **ASSISTANT TO MANAGER**; should have had shop experience, or as machinery salesman. Address, stating age, references, past experience and compensation expected, "Graduate," care *The Iron Age*, New York.

An experienced **DRAFTSMAN** in conveyor and elevator engineering; also several first-class **STRUCTURAL STEEL DRAFTSMEN**; state age and terms. Address Heyl & Patterson, Pittsburgh, Pa.

FOREMAN BOILER MAKER, by a shop employing about 150 men; man must have complete knowledge of all details and able to handle men to best advantage; good salary to proper man; give age, references and salary expected. Address "F. B. M.," care *The Iron Age*, New York.

EXPERT LAYER OUT for boiler shop; one accustomed to laying out intricate work from blue print. Address, giving age, experience and salary wanted. "V. O.," care *The Iron Age*, New York.

Situations Wanted

Undisplayed Advertisements for Situations Wanted not exceeding twenty-five words, including address. Fifty cents each insertion. Additional words two cents each.

CHIEF CLERK and **ASSISTANT** to **SUPERINTENDENT** of large blast furnace plants, is now open for a position of trust; 29 years old, sober, energetic and accustomed to hustle; let us talk it over. "Energetic," care *The Iron Age*, 117-119 South Fourth street, Philadelphia, Pa.

EXPORT.—Forks (hay, manure, stone, coke, &c.), shovels, picks, agricultural and mining tools, wood handles, &c.: Englishman (27) desires position with manufacturers as **HEAD OF DEPARTMENT** and **FOREIGN TRAVELER**; 12 years' experience in export hardware, tools; specially acquainted European and South American markets; successful foreign traveler, large connection; speaks French, German, Spanish, Portuguese, Dutch, some Italian and Russian. Address in first instance 133-1, Ironmonger office, 42 Cannon street, London.

FOUNDRY FOREMAN desires position; 10 years' experience as such on dry, green, sand and loam; can handle any class of work, the heavier grades preferred; engines, pumps, rolling mill machinery, &c. Address "C. C.," 821," care *The Iron Age*, New York.

Open hearth melter will take job as **TURNERMAN** in large works; satisfactory reference. Address "Duff Gas Producers," care *The Iron Age*, New York.

CHEMIST and **ENGINEER** (32) about opening office for consulting practice in New York City, would act as correspondent, buyer or undertake other business not demanding whole time for responsible concern not represented there. Address "Chemical Engineer," care P. O. Box 3015, New York.

By a young man, college graduate; eight years in large foundry and machine shop, as **ASSISTANT SUPERINTENDENT**, **SALES CLERK** and **PURCHASER**; good draftsman and cost keeper; moderate salary. Address "M. M.," care *The Iron Age*, New York.

Hardware, machinery or supplies **SALESMAN**; five years on the road; pay me according to my value; satisfaction guaranteed. Address Thos. L. Reid, Addran, Texas.

Superintendent of large screw and bolt works will shortly be open for engagement; 12 years in charge of bicycle, electrical machinery and machine tool plants. Address "Bolts," care *The Iron Age*, New York.

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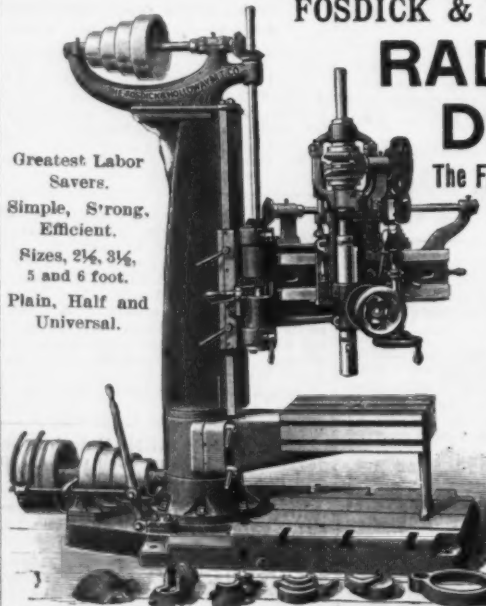
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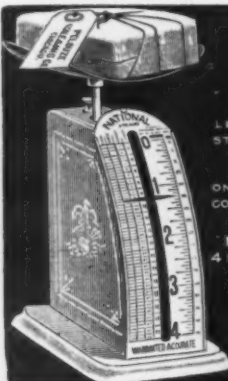
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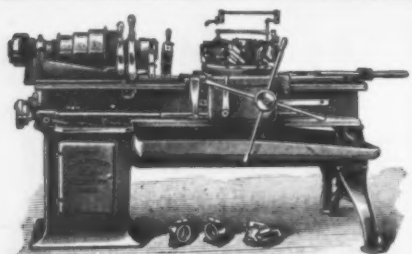
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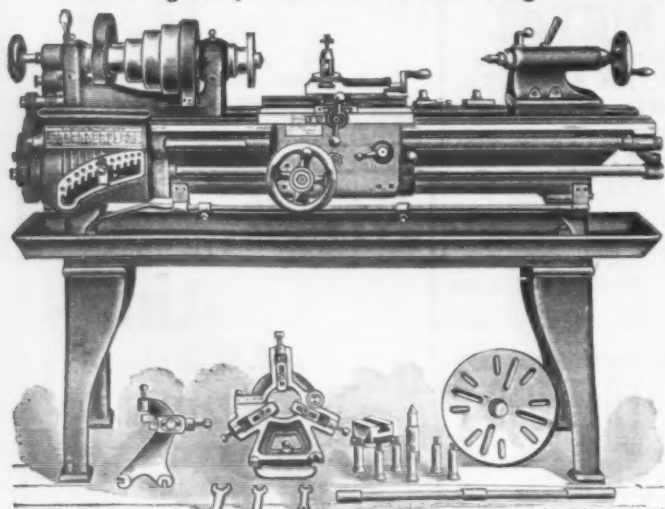
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The Automatic Colt Pistol.

The new automatic pistol manufactured by the Colt's Patent Fire Arms Mfg. Company of Hartford, Conn., possesses features which are strikingly novel and original and which will undoubtedly place the weapon in the front rank of small arms. It is made in 38 caliber, using a special rimless cartridge having a jacketed bullet. This cartridge gives a muzzle velocity of about 1300 feet per second and a penetration of about 11 inches in pine. The magazine contains seven cartridges, and any desired number of these magazines can be carried with the pistol, which can be fired at the rate of seven shots in 1 2-5 seconds. The accuracy of the pistol is remarkable, and the design of the arm is such that the recoil is

The cartridges are automatically supplied to the pistol from a detachable magazine, which, after being filled with cartridges, is inserted into the handle of the pistol.

After thus charging the pistol with a full magazine, one opening movement is made by hand, after which the loading of the cartridge into the barrel, the firing on touching the trigger, the extraction of the empty shell after firing, and the reloading of a new cartridge into the barrel, all take place automatically, without any manipulation whatever. This automatic operation of the pistol is actuated by the recoil of the moving parts, and the recoil, being thus utilized and absorbed, has no disturbing effect.

The three main parts of the pistol are the receiver 1, the barrel 2 and the slide 3. The receiver has suitable guides for the reciprocating slide, and below the re-



THE AUTOMATIC COLT PISTOL.

in a great measure absorbed, so that the marksman has no annoyance from this cause. Further than this, and a characteristic of the construction of the greatest importance, is the ease with which the pistol can be taken apart for inspection or cleaning. The design is wonderful in its extreme simplicity, the parts being few and so grouped as to form a most compact and conveniently handled arm.

Construction of the Pistol.

Of the accompanying engravings the first three represent the pistol two-thirds actual size. Figs. 4 and 5 are identical, except that the first is a shaded sectional elevation, while the second is a plain section having all the parts numbered. All the parts separated, and correspondingly numbered and named, are indicated in Fig. 6, which may be considered a key to Figs. 4 and 5. The remaining drawings, Figs. 7 to 15 inclusive, illustrate interesting operations in the manufacture of the pistol. The numerals in the following description refer to Figs. 5 and 6:

The action of this pistol is automatic, with the exception that the trigger has to be pulled for firing each shot.

ceiver is the handle, which is hollow, and forms the seat for the reception of the cartridge magazine 36, which, after being charged with seven cartridges, is inserted from below into the handle and is there removably held by the magazine catch 34, which slightly projects from the bottom of the handle. This projection serves as a will to release the magazine, when it may be readily drawn from the handle for recharging.

In front of the handle is the trigger guard, in which the trigger 18 is located, and in the rear and above the handle the firing mechanism is arranged in the receiver, consisting of the hammer 14, the sear, safety and trigger spring 22, the lower part of the latter serving to actuate the magazine catch 34.

The top of the receiver extends forward from the handle, and to it the barrel is attached by two short links 32, one near the front end of the barrel and one at its rear end. These links are attached to the receiver by link pins 31, and also to the barrel by similar link pins 33, and allow the barrel to swing rearward thereon. As both links are of the same length, the rearward movement of the barrel in swinging thereon carries the barrel

slightly downward, but keeps its longitudinal axis during all its movements parallel.

Below the barrel the receiver forms a tubular seat for the retractor spring 28, which in front is closed by a plug, 30, fastened in the receiver by the forward lower link pin 31. The top surface of the receiver and two longitudinal grooves on its sides form the seat for the slide 3, which is guided thereon in its rear and forward movements. The rear part of the slide forms a bolt, the forward extension of which is in the form of a partly tubular cover which incloses the barrel.

In the forward part of the receiver is a transverse mortise extending through the retractor spring seat, and transverse recesses in the forward part of the slide serve to admit the slide lock 3, which, passing through the sides of the slide and through the mortise, serves to lock the slide to the receiver. The retractor spring 28, in its seat in the receiver, consists of a spiral spring, the rear end of which rests against a short stiff recoil spring, 27, located between the retractor spring and the receiver.

The magazine 36 is a tubular holder in which seven cartridges are placed one upon the other, resting upon a follower, 37, actuated by a spring, 38, by which they are pressed upward. The upper end of the magazine is open to permit the escape of the cartridges, and the side walls at the rear of this opening are turned inward and engage the topmost cartridge to prevent its escape from the magazine, except when it is pushed forward.

The Operation of the Pistol.

The operation of the pistol is as follows: When a charged magazine is inserted into the handle the slide is once drawn to the rear by hand, thereby cocking the hammer. In this position of the slide, Fig. 2, the magazine follower and follower spring raise the topmost cartridge so as to bring it into the path of the bolt. On releasing the slide it, with the bolt, is carried forward by the retractor spring, and during this movement the bolt forces the topmost cartridge into the barrel. As the slide approaches its forward position the front of the



Fig. 2.—Slide in its Most Rearward Position.

THE AUTOMATIC COLT PISTOL.

and the front end of the retractor spring carries a follower, 29.

The rear face of the slide lock 13 has a slight recess, and when this lock is in its place the front end of the follower 29 rests in this recess, thereby confining the slide lock laterally; and thus the tension of the retractor spring is exerted to force the slide 3 to its forward position, while the recoil spring 27 serves to receive and to absorb any excess of recoil of the slide 3.

Upon the barrel are provided three transverse ribs and in the interior of the slide are three corresponding recesses. These serve to lock the barrel and the slide firmly together when in their forward or closed position.

Between the locking recesses and the front of the bolt the slide has an opening through its right side, Figs. 1, 2 and 3, for the ejection of the cartridge cases, and the bolt is provided with an extractor, 10, a firing pin, 4, a firing pin spring, 5, and a firing pin lock, 6. This lock is pivoted at the rear end in the top of the slide, and when depressed locks the firing pin in its retracted position, thus preventing its point from coming in contact with the cartridge primer. When raised, the firing pin lock releases the firing pin, and in this position it also serves as the rear sight, being provided on top with a sighting notch. The lock is kept in either of its positions by the firing pin lock stop 8 and spring 9.

bolt encounters the rear end of the barrel and forces the latter to its forward position. During this forward movement the barrel swings forward and upward on the links, and thus the locking ribs on the barrel are carried into the locking recesses in the slide, and barrel and slide are thereby positively interlocked and the pistol is ready for firing.

A slight pull on the trigger now serves to move the sear so as to release the hammer and fire a shot. The force of the powder gases driving the bullet from the barrel is rearwardly exerted against the bolt and, overcoming the inertia of the slide and the tension of the retractor spring, causes the slide and the barrel to recoil together. After moving rearward together for a distance, enough to insure the bullet having passed from the barrel, the downward swinging movement of the barrel releases the latter from the slide and stops the barrel in its rearmost position. The momentum of the slide causes the latter to continue its rearward movement, thereby again cocking the hammer and compressing the retractor spring until, as the slide arrives at its rearmost position, the empty shell is ejected from the side of the pistol and another cartridge is raised in front of the bolt. During the return or forward movement of the slide, caused by the retractor spring, the cartridge is driven into the barrel and the slide and barrel are interlocked, thus

making the pistol ready for another shot. These operations may be continued so long as there are cartridges in the magazine, each discharge requiring only the slight pull on the trigger.

The pistol is provided with a safety device, which makes it impossible to release the hammer unless the slide and the barrel are in their forward position and safely interlocked. This safety device also serves to control the firing and to prevent more than one shot from being fired for each pull of the trigger. The safety device consists in a small vertical piece, 20, mounted in front of the sear in the receiver, the end of which slightly projects from the top of the receiver, and in its raised position finds a corresponding recess in the bottom of the bolt, when the latter, with the slide, is in

Directions for Taking the Pistol Apart.

In order to take the pistol apart the hammer is cocked and the slide is drawn to the rear until the slide lock has passed above a small hole in the bottom of the receiver leading into the retractor spring seat. By inserting a pin, Fig. 3, into this hole and moving the slide forward, the retractor spring and follower are prevented by the inserted pin from following the lock forward, and the latter, thus freed from the follower, will readily pass from the left side of its seat in the receiver and slide. The lock thus removed, the slide may be drawn rearward entirely from the receiver, as shown in Fig. 3.

To remove the barrel from the receiver it is only necessary to drive out the link pins which hold the barrel links to the receiver. This also releases the plug, which



Fig. 3.—Slide Removed.

THE AUTOMATIC COLT PISTOL.

the forward position interlocked with the barrel. In this raised position the safety piece does not interfere with the operation of the trigger, but when the slide is moved rearward the bottom of the bolt depresses the safety piece, which, in that position, prevents the movements of the trigger from operating the sear, and thus the hammer cannot be released until the slide is again in its forward position, locked to the barrel.

The locking of the firing pin by the firing pin lock 6, so that it cannot reach the primer of the cartridge even if struck by the hammer, insures the safe handling of the pistol when not in use. The fact that the firing pin lock is also the rear sight of the pistol prevents ineffectual attempts to shoot the arm without first having released the firing pin lock. The sighting notch in the top of the firing pin lock is cut at such an angle that when the lock is depressed the notch cannot be brought into line with the front sight. This impossibility of aiming the pistol thus gives instant warning that the firing pin lock should be released and the rear sight raised.

may then be removed from its seat, when the retractor spring, the follower and the recoil spring may be readily removed from their seat in the receiver.

After removing the scales from the handle, by turning out the screws holding them to the receiver, all the parts of the firing mechanism may be readily removed by taking out the screws and pins holding them in the receiver. The pistol is assembled by proceeding in the reverse order.

Interesting Operations in the Manufacture of the Pistol.

By referring to Fig. 4 it will be noticed that the upper portion of the interior rear side of the handle of the receiver curves outwardly to form a space for the main spring and hammer to work in. The cutting out of this material is performed by the machine shown in Figs. 7 and 8, which was designed especially for the purpose. In the head of the machine is a slide to which is imparted a reciprocating motion. Projecting from the forward end of this slide is a curved bar which has, near the ex-

tremity, a slot. Entering this slot is a pin carried by a cutter holder, which is pivoted to a jig. The reciprocating movement of the slide causes the cutter to vibrate

The jigs used for boring the holes in the receiver are shown in Figs. 9 to 12. These are self explanatory. A complete set of jigs has been provided for the making of

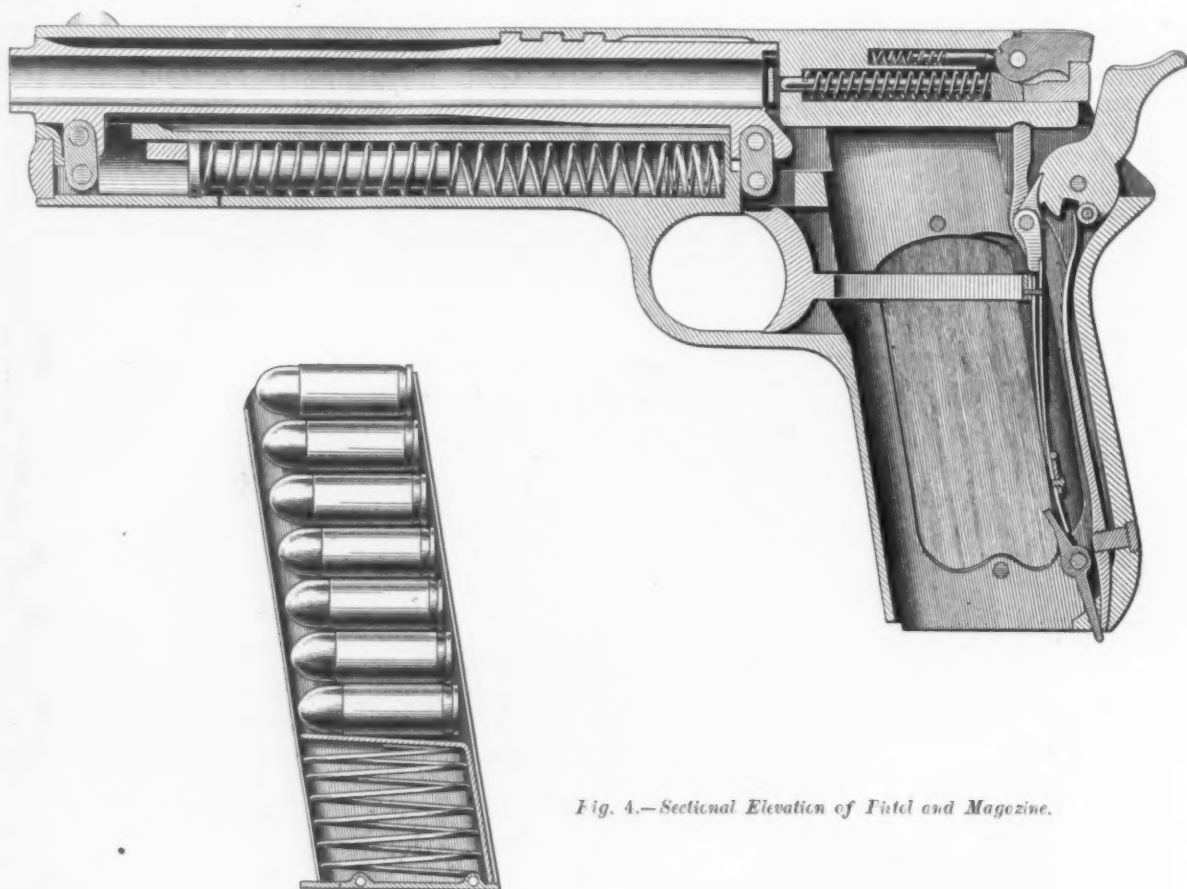


Fig. 4.—Sectional Elevation of Pistol and Magazine.

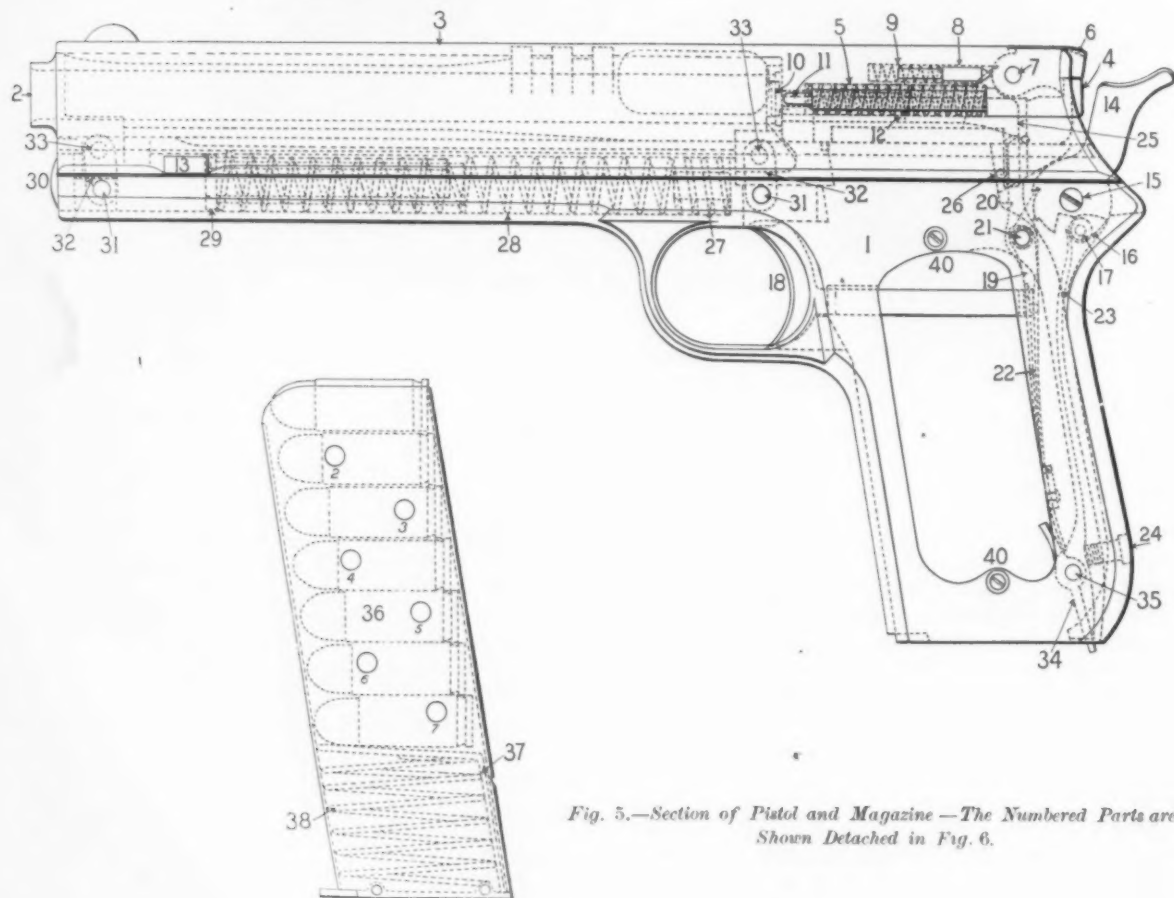


Fig. 5.—Section of Pistol and Magazine.—The Numbered Parts are Shown Detached in Fig. 6.

THE AUTOMATIC COLT PISTOL

on its pivot and move in a segment of a circle. When the receiver of the pistol is locked in the jig the cutter removes all the material necessary to produce the curved recess for the hammer.

every part of the pistol, thereby insuring absolute accuracy and interchangeability.

The surface plate, Fig. 14, is employed for testing the slide after the first operation upon it. The slide is made

from the solid and, after the exterior has been brought to shape, standard plugs are inserted in the ends and the under side of the slide is tested on the surface plate for high and accuracy of line.

The milling cutter, Fig. 13, is used for removing stock from the interior of the slide. The interior of the slide is not one continuous surface parallel with the exterior, but consists in reality of two surfaces in different planes. To accomplish this the machine shown was originated. The shell is held in a chuck carried by a table which moves across the axis of the spindle, upon the outer end of which is mounted the milling cutter. In each side of the table, the right hand end of which is hinged, is a groove formed of two parallel portions which are not in the same line. Pivots supported from the frame of the machine enter these grooves. It is evident that, the cutting starting from the right and

its end that at each one-half revolution of the mandrel receive a cam lever that is used to set each and every one-half coil of the spring as it progresses to the proper length.

We wish to acknowledge the kind courtesy of the officers of the company for their assistance in the preparation of the above article.

The inventory and appraisement of the personal estate of the late H. M. Curry of the Carnegie Steel Company, at Pittsburgh, were filed last week. The value of the estate is given as \$3,273,350.60. Among items in the appraisement is a loan to the Carnegie Steel Company, being the credit balances, as shown by the books of the company, of \$233,785.18. The list includes also 2829 shares of stock of the Carnegie Steel Company, Limited, par value \$1000, and 969 bonds of the Carnegie Steel Company, face value \$3,000,000. Appended to the appraisement is a statement that the stock of the

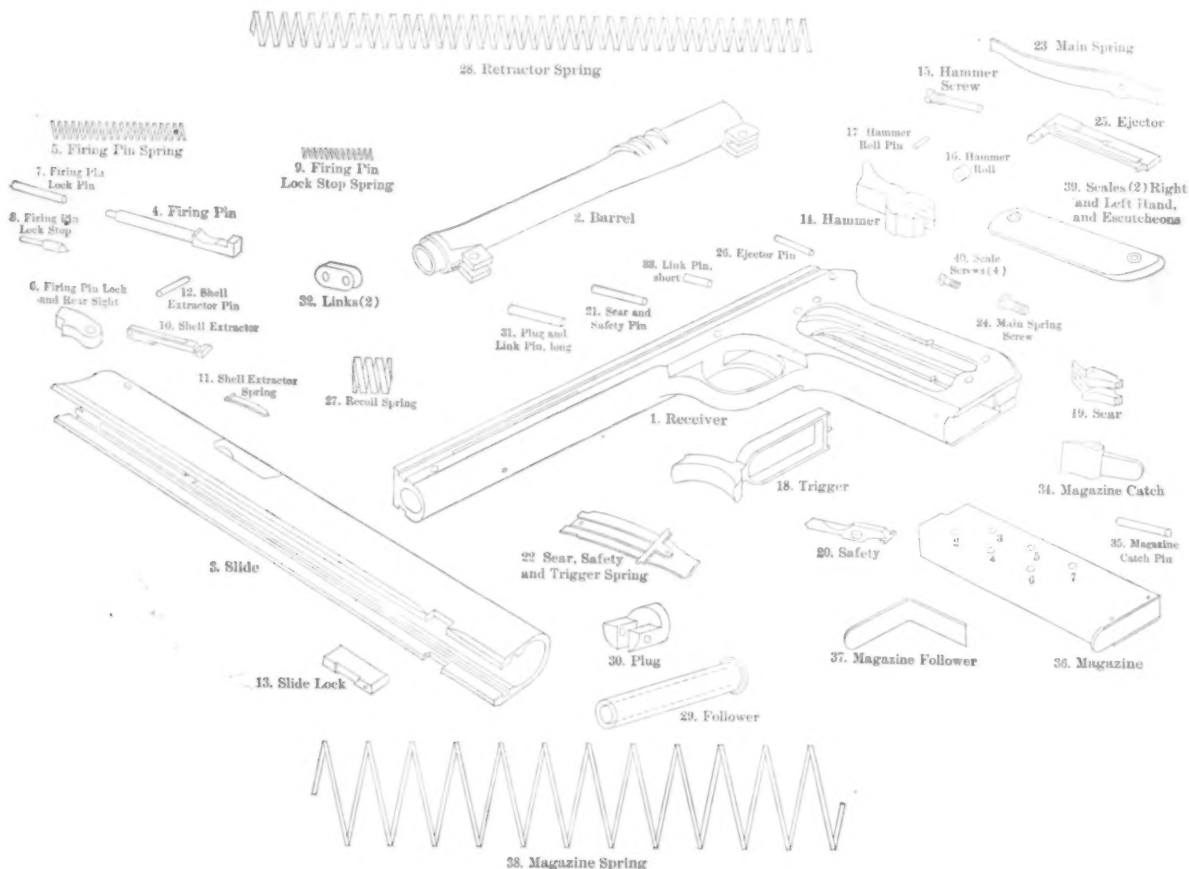


Fig. 6—All the Parts of the Pistol.—Their Location is Indicated in Fig. 5

THE AUTOMATIC COLT PISTOL.

moving toward the left, the pivots will be in the lower groove and the most metal will be removed from the inside of the slide. As the table continues its travel the pivots enter the upper portion of the groove and thereby lower the table to produce a slighter cut in the slide.

Magazine Spring Machine.

This machine, Fig. 15, is used to wind an oblong coil spring, size 1.20 x 0.36 x $\frac{3}{4}$ inch pitch, from tempered steel music wire of 0.041 inch diameter, and is operated in the following manner: First, the wire is put on the reel in a proper manner so that it will run free. It is then carried through the feed rollers and engaged with the mandrel, the upper and lower rollers being set at the proper angle to give the spring the right pitch. The rollers have their bearings in movable slides, so that the oblong mandrel, as it rotates, can raise them to its highest point, from where they are forced back by heavy coil springs which keep the wire firmly against the mandrel, which gives the spring its shape. The slides also carry guides at the side of the rollers to assist them in forcing the spring off from the mandrel, which has two pivots at

its end that at each one-half revolution of the mandrel receive a cam lever that is used to set each and every one-half coil of the spring as it progresses to the proper length.

A press dispatch from Cleveland, Ohio, states that on the 28th ult. the Continental Iron Company, operating mills at Niles, Ohio, and Wheatland, Pa., filed a petition in voluntary bankruptcy. The action was precipitated by a suit for \$225,000 and interest amounting to \$18,000, instituted by Rogers, Brown & Co., the Tennessee Coal, Iron & Railway Company and the Virginia Iron Company. The cause of the suit is alleged to be the admission of the Continental Company of their inability to meet their obligations. The cause of the failure is said to be the shrinkage in iron values. The plants of the company are in fine condition, and the managers declare that they will be able to pay the debts if permitted to operate under an order of the court.

The report of the sale of the Adler brown ore mine properties, in Franklin County, Ala., to the Sloss-Sheffield Iron & Steel Company was confirmed on the 26th ult. The consideration was in the neighborhood of \$300,000. The properties include some of the most valuable brown ore mines in Alabama, four modern coal washers, &c.

Iron and Steel Rails in America.*

BY ROBERT W. HUNT, CHICAGO.

As America came to Great Britain for the rails used on her first railroads, it is perhaps fitting that this paper should be presented to the society in London, and at its first English meeting.

The facts relating to the introduction of rails into the

but the road was never built. In April, 1823, the New York Legislature granted a charter to the Delaware & Hudson Canal Company to construct a canal and railroad for the transportation of coal from the anthracite coal fields of Pennsylvania to the Hudson River. The road was 16 miles long, but was not completed until 1829. It was on this road that the first locomotive was run in America.

On Saturday, August 8, 1829, the "Stourbridge Lion,"

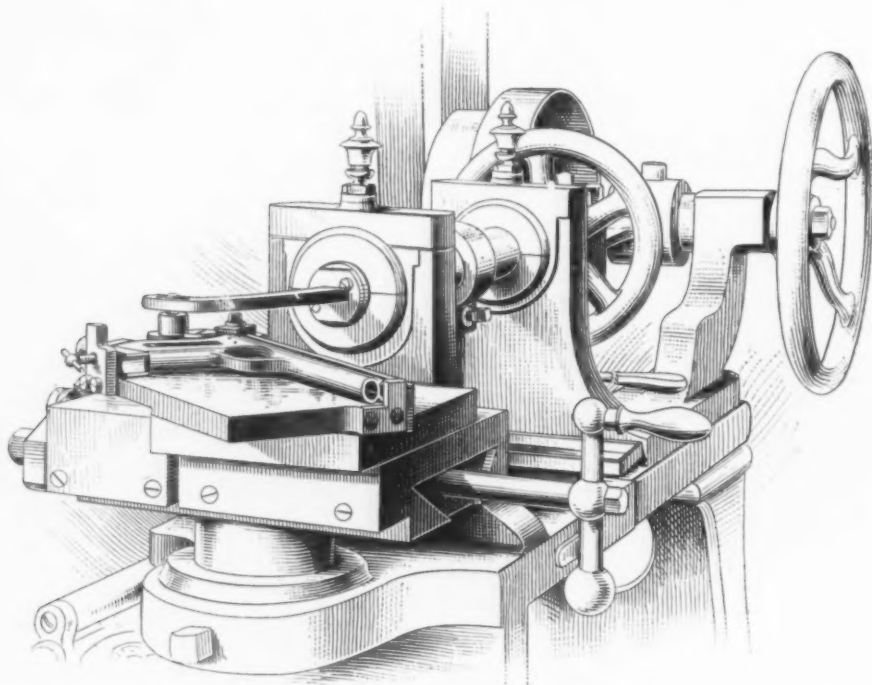


Fig. 7.—Cutter for Forming the Main Spring Seat.

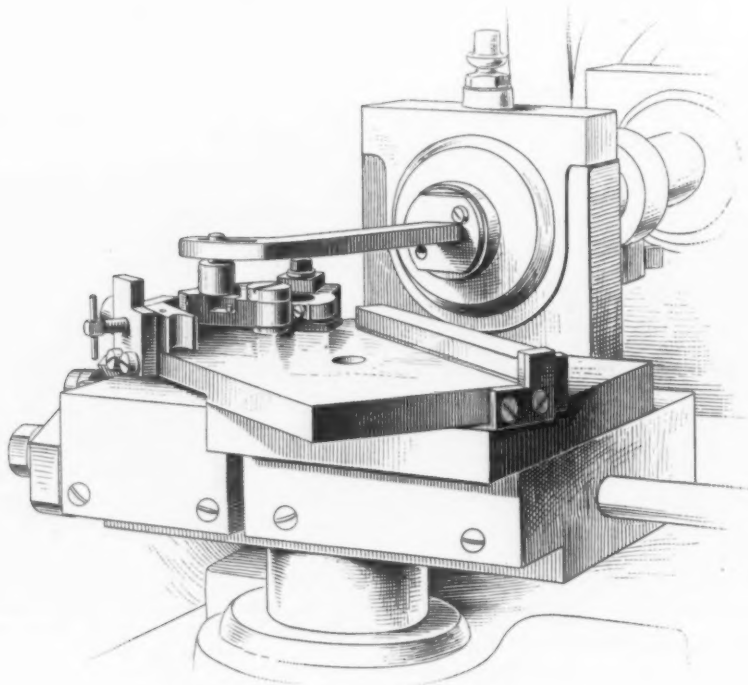


Fig. 8 — View of Fig. 7 with Pistol Receiver Removed.

THE AUTOMATIC COLT PISTOL.

United States, and, later, their manufacture in that country, are historically recorded, and will only be briefly referred to herein. In obtaining the data, free use has been made of James M. Swank's valuable work, "Iron in all Ages."

Early Railroad History.

The first charter for a railroad in the United States was granted by the Legislature of New Jersey in 1815.

*Read before the American Society of Civil Engineers, London meeting.

built in England, and weighing 6 tons, made its first trip; but its active life was short, as it was found to be too heavy for the superstructure of the road.

The first American built engine was operated on the Baltimore & Ohio Railroad in August, 1830. It was named "Tom Thumb," and was designed and constructed by Peter Cooper, who was somewhat restricted as to materials, as he had to use gun barrels for tubes. The whole machine weighed but 1 ton, and burned anthracite coal. The experiment was successful, and, based on it, later machines were designed and built;

the first one of practical size and use being the "Best Friend of Charleston," which was constructed at the West Point Foundry, in New York City, for the Charleston & Hamburg Railroad of South Carolina. It went into active and successful use on that road in December, 1830.

Only some five years intervened between the opening of the first railroad in the world intended for general freight and passenger service—the Stockton & Darling-

people, were soon not satisfied to follow, but aspired to lead. Thus, the next passenger railroad to be constructed was the Charleston & Hamburg, already mentioned. This was opened for public use in December, 1830. In September, 1833, it was completed for a distance of 135 miles, and was "the longest continuous line of railroad in the world."

The nucleus, from which later came the great New York Central & Hudson River Railroad system, was the

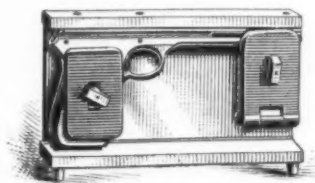


Fig. 9.

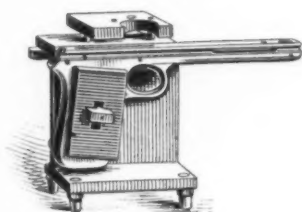


Fig. 10.

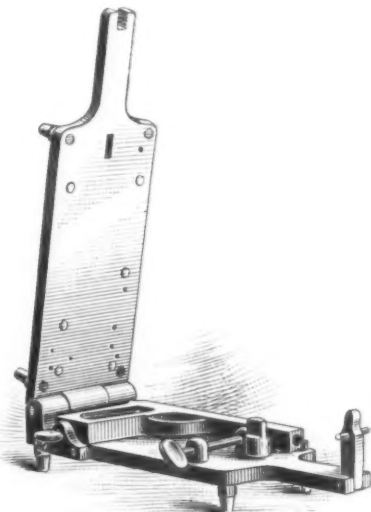


Fig. 11.

Jigs for Drilling the Receiver.

Fig. 12

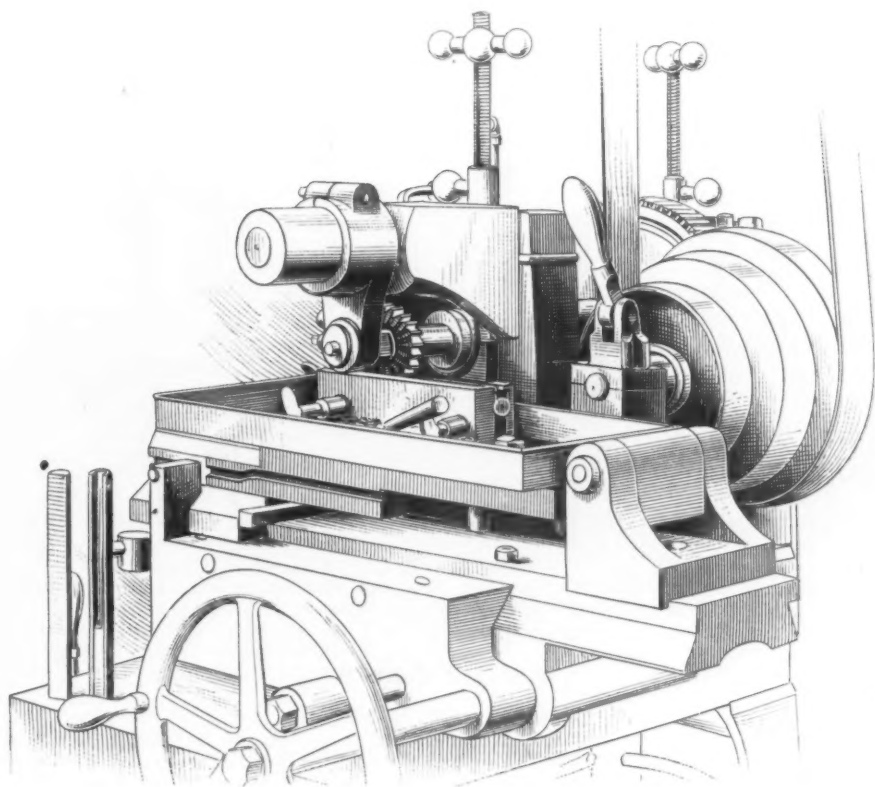


Fig. 13.—Machine for Milling the Slide.

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ton—September, 1825, and that of the first one in the United States for the same purposes—the Baltimore & Ohio. Its construction was begun on July 4, 1828, and "cars were put upon it for the accommodation of the officers, and to gratify the curious by a ride," in 1829; but it was not formally opened for travel until May 24, 1830. It was then 13 miles long, extending from Baltimore to Ellicott's Mills, Md.

Thus, in railroad building, as in many other things, the Americans were early disposed to follow closely after their English relatives; and perhaps, like other younger

Mohawk & Hudson Railroad, chartered by the New York Legislature in 1826, but not begun until 1830, and opened for travel in 1831. It extended from Albany to Schenectady, 17 miles.

There were some earlier railroads, or more properly tramways, built in the United States, but those named were the first really commercial roads.

The First Rails Used.

The rails used on these roads were of wood, with flat bar iron nailed to the upper surface. The track of the

Baltimore & Ohio Railroad is described as consisting of: "Cedar cross pieces, and of string pieces of yellow pine from 12 to 24 feet long and 6 inches square, and slightly beveled at the top of the upper side for the flanges of the wheels, which at that time were on the outside. On these string pieces iron rails were placed, and securely nailed down with wrought iron nails 4 inches long. After several miles of this description of road had been made long granite slabs were substituted for the cedar cross pieces and the yellow pine stringers.

"The iron used for rails was $\frac{1}{2}$ to $\frac{5}{8}$ inch thick by $2\frac{1}{2}$ to $4\frac{1}{2}$ inches wide. The heads of the nails or spikes holding it down were countersunk in it."

One would judge, from the varying thicknesses and widths, that the specifications and inspection were not very rigid.

Notwithstanding these strap rails being "securely nailed down," it was found that traffic would loosen them, with the final result of their turning up as the wheels passed over them, and forming what were called "snake heads." These would occasionally tear through the bottom of the cars, and cause more or less inconvenience if not danger to the passengers. So the American engineers again turned to England, where the same difficulties had led to the invention of rails of different sections. It is believed that the first one was the fish bellied rail, invented by John Birkinshaw of the Beddington Iron Works, and patented in October, 1820. This

Another English section was the H rail, which rested in a chair. These were imported and used on some of the roads. Still later came the U rail, known in Wales as the Evans patent, and believed to have been first rolled at the Dowlais Works.

Some of the flat strap rails were made in America, but all the sectioned ones were imported. Some attempts were made to use American cast iron rails, but with unsatisfactory results. It was not until 1844 that the manufacture of sectioned wrought iron rails was begun in America. A rolling mill was built in 1843 by the Mount Savage Rolling Mill Company, at Mount Savage, Alleghany County, Md., expressly to make rails. Operations commenced in 1844, and for their first rail, which was of the U section, they were awarded a silver medal by



Fig. 14 — Testing the Slide on a Surface Plate.

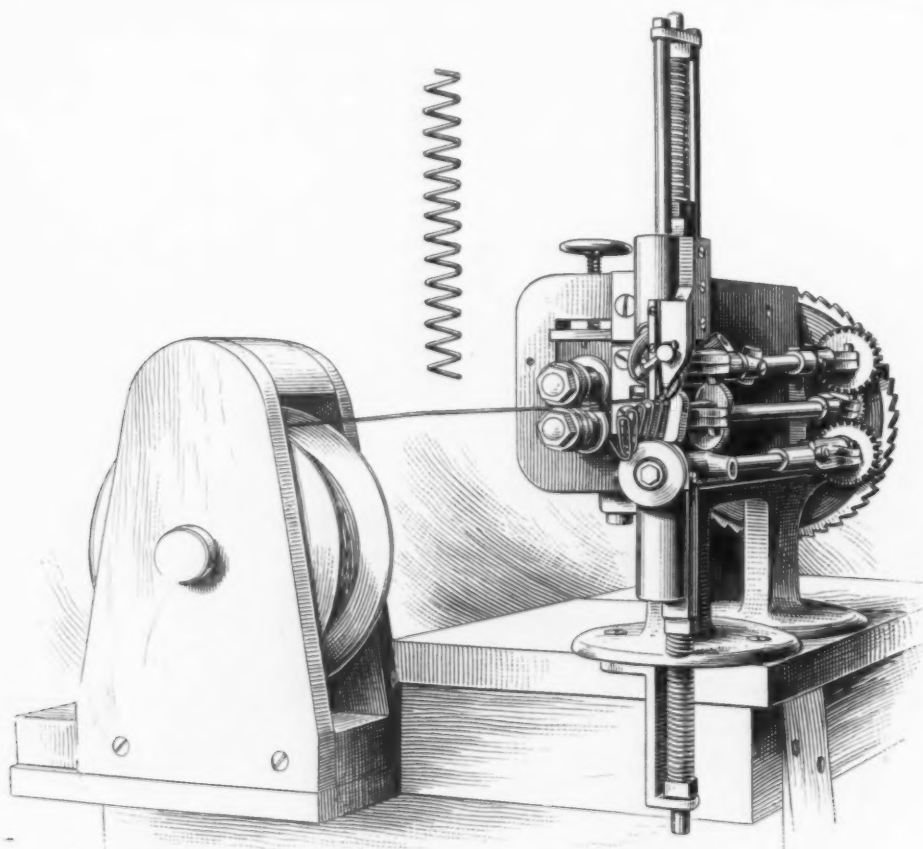


Fig. 15 — Magazine Spring Machine.

THE AUTOMATIC COLT PISTOL.

rail was held in cast iron chairs by side keys or wedges. The Baltimore & Ohio Company soon afterward imported some of these rails.

The Stockton & Darlington, and its follower, the Liverpool & Manchester, which was opened in September, 1825, were principally laid with rails of the Birkinshaw type. The Stockton & Darlington also had a few cast iron fish bellied rails.

The Clarence rail was another English invention, and was considered an improvement on the Birkinshaw. Rails of that pattern were imported into America for the Alleghany Portage Railroad, built by the State of Pennsylvania over the Alleghany Mountains to connect the canals on either side of them. This road was opened in 1833.

In 1834 the Columbia & Philadelphia Railroad was opened. Part of this was laid with flat rails, but on the greater part the Clarence rails were used. On both roads the rails rested on stone blocks. These roads were in after years absorbed by the Pennsylvania Railroad.

the Franklin Institute of Philadelphia. The rail weighed 42 pounds per yard. About 500 tons were laid in 1844 on the road then being built between Mount Savage and Cumberland, Md. A short time later they rolled some 52-pound rails for a road between Fall River and Boston, and in 1845 and 1846 they rolled T rails. This mill, after being long abandoned, was finally dismantled in 1875.

Invention of the T Rail.

The T rail was generally known in Europe as the Vignoles rail, after Charles V. Vignoles, an English railroad engineer, who introduced its use there. But it was really invented by Robert L. Stevens of Hoboken, N. J., president and engineer of the Camden & Amboy Railroad.

In 1845 the Montour Rolling Mill, at Danville, Pa., was built expressly to roll T rails, and in October of that year there was rolled in that mill the first rail of that section made in America.

In 1846 T rails were rolled by the Boston Iron Works, Boston, Mass.; by Cooper & Hewitt's mill, at Trenton, N. J.; by the New England Iron Company, Providence, R. I.; by the Phoenix Rolling Mill Company, Phoenixville, Pa.; by the Great Western Iron Company, Brady's Bend, Pa., and by the Lackawanna Iron Works, Scranton, Pa.

In the following years the manufacture was taken up by other companies, but owing to the commercial conditions caused by the severity of foreign competition, early in 1850, only two out of the 15 rail mills in the United States remained in operation.

These early rails were all short—none over 15 feet long. As the difficulties of manufacture were overcome and the science of track laying progressed the length was gradually increased until 21 feet was reached, and was considered the limit. It was not until about 1859 that railway engineers would accept those of greater length.

The first 30-foot rails rolled in America were made by the Cambria Iron Company, Johnstown, Pa., in 1855; but they could not find sale for them, and they were finally used by that company in their mill yards. The first 30-foot rails to fill an order were rolled by the Montour Company, in January, 1859, for the Sunbury & Erie Railroad Company.

The rolling of iron rails was attended with many difficulties. If the pile of bars was not heated to a sufficiently high degree the welds would not be perfect; and if heated too highly the iron would crack in the process of rolling and yield an imperfect product. If the metal was too soft, although the rail might be free from flaws and bad welds, it would wear out rapidly under traffic. Under all circumstances it was important that the rolling process should be completed as quickly as possible, so that the reductions should be made while the iron had lost little of its heat. This, together with some local conditions, led to the invention by John Fritz of the three-high rail train. Three-high sets of rolls had been used for many years in making merchant bars, but it required the application of the Fritz yielding hanging guides and driven feed rollers to make them practical for rail rolling. This improvement was put into successful operation at the Cambria mills in 1857. It has ever since remained as the typical American rail mill. Since the introduction of steel rails there have been several two-high reversing mills on the English plan used in America; in fact, two of this kind are now running. But the three-high is the American mill, and has permitted the tremendous production which has been attained in later years.

Displacement of Manual Labor.

The early mills required the work of handling the material as it passed through the rolls to be done by manual labor, through the use of tongs and hooks. Probably the rolling of iron piles, with their necessarily peculiar handling, would have indefinitely continued this, but with the use of solid steel blooms the troubles lessened and made possible the introduction of automatic machinery. The tong and hook system necessitated the employment of 15 to 17 men, and the production of steel rails was limited to not over 250 tons per turn. Automatic machinery revolutionized this, both as to number of men employed and the possibilities of production.

It was the writer's fortune to introduce the first driven rail mill tables, those in the works of the Albany & Rensselaer Iron & Steel Company, Troy, N. Y., in March, 1884. These were in front of the finishing rolls, and worked so well that an automatic arrangement was soon after placed in front of the roughing rolls. This latter arrangement was more particularly designed by Max M. Suppes, then the master mechanic of the works, and now the general manager of the Lorain Steel Company, Lorain, Ohio. Naturally, these devices were protected by letters patent. From this start other inventions were made, and many improvements by other American engineers have followed, until the present American rail mill, capable of turning out 50,000 tons of finished rails per month, has been developed.

It was the writer's fortune to become connected with rail making in 1856, and among his earliest recollections is the statement that the users of rails had in service certain makes which had been and were giving good results impossible to be obtained from any of more recent manufacture. How familiar that statement must sound to many of you, and as of recent date.

Then, as now, the question demanded an answer, and many sought for the solution.

Old Methods of Making Rails.

The first iron rails were made from straight puddled bars. These bars were about 1 inch thick and were placed one upon another until a pile of sufficient weight and height was formed; the pile was then reheated and rolled into rails. And it was to the formation of that pile that inventive genius was applied.

From an investigation of the fracture of some of the rails which had given satisfaction, it was discovered that the pile of bars from which they had been rolled had been entered into the rolls edgewise, thus bringing a line of welds between the bars in vertical instead of horizontal position. This presented a different structure to the wheel wear, and seemed to be logical. Based on this supposition many rails were so rolled, and the writer believes that the scheme was patented.

Where the rail was rolled with the layers of the pile in a horizontal position particular attention was given to the character of the top bar, which would, of course, form the wearing surface of the rail. Cold short granular iron was used for it, while the remainder, or at least the flange of the rail, was of fibrous iron.

At one time a rail with a puddled steel head or rather with the top bar of the pile of puddled steel found much favor, but, owing to the difficulty of obtaining uniformly good welds, the results were not satisfactory. Some of these so-called steel headed rails had the top bar of what was known as silicon steel.

Another plan, on which much money was spent, was to hammer a puddled ball, or weld two puddled balls together, under a steam hammer, and draw them into a slab 2 to 2½ inches thick, which was used on the top of the rail pile. Under an order from the Pennsylvania Railroad Company, the Cambria Iron Company, whose employ the writer was then serving, erected a special steam hammer, and made several thousand tons of such rails. Their service was somewhat disappointing, and the practice was abandoned.

At that time, as since, commercial conditions controlled. The railroads had the worn out rails on the hands, and regardless of whether or not the practice would give satisfactory results they adopted a system of having the old rails rerolled into new ones. At first a certain percentage of new iron was specified, but as the necessities for immediate economies increased that demand was eliminated from the contracts, and the new rails were composed entirely of the old ones. The best practice was to make a pile of old rails and break it down into bars, which were piled upon each other and then rolled into rails. But presently this was found to be too expensive to successfully meet the cry for cheaper rails, and only the top and bottom of the piles were formed from reworked iron, the center being composed of from three to six pieces of old rails.

From the many reworkings, the cheapening of the process of manufacture and the increasing demands of traffic, the wear of the iron rails became more and more unsatisfactory, until it seemed as though, from that cause alone, the limit of railway development had been reached. Such situations frequently occur in earthly affairs; and seldom if ever has the occasion failed to be met by a solution of its difficulties. In this case came the invention of Bessemer.

Introduction of Steel Rails.

It is a historical fact that the first rail ever made from Bessemer steel was produced on the Midland Railroad of England early in 1857, at a point where iron rails had sometimes to be renewed in three months; and it remained there until June, 1861, some 16 years, during which time about 1,250,000 trains and any number of detached engines and tenders passed over it.

We all realize that without such an innovation as Bessemer's the subsequent tremendous expansion on railway development would have been physically impossible.

Railway managers were timid about using steel rails, and in America many attempts were made to produce a satisfactory rail having an iron base and web, with a steel capped top. None was satisfactory, and the Bessemer steel rail soon conquered the situation.

The first steel rails laid down by an American railroad were imported by J. Edgar Thomson, president of the Pennsylvania system.

The first to be manufactured in America were rolled at the mills of the North Chicago Rolling Mill Company, Chicago, Ill., on May 24, 1865, from ingots produced in experimental steel works, at Wyandotte, Mich. They were not many in number, and were made on the regular iron rail rolls of the mill. Several of the rails were put in local railway tracks and gave good service.

The first production of steel rails in the United States on a commercial order was at the Cambria Iron Company's mill, in August, 1867, from ingots made by the Pennsylvania Steel Company, near Harrisburg, Pa. The converting works of that company were completed some time in advance of their rail mill, which led to an arrangement under which the ingots were sent to Johnstown to be hammered into blooms, which were then reheated and rolled into rails. The steel was made under the management of the late Alexander L. Holley, then in charge of the Pennsylvania Steel Company. George Fritz was the chief engineer and general superintendent of the Cambria Iron Company, and Alexander Hamilton superin-

tendent of the rail and other mills, while the writer was in direct charge of the steel department.

It is a matter of some interest that the ingots were drawn down by the steam hammer which had been installed some years before to make the hammered iron slabs for the Pennsylvania Railroad Company's rails. From this time the production in America of Bessemer steel rails increased rapidly.

Improvements in Methods.

For a time after the starting of the Pennsylvania Steel Company's Bessemer works the ingots were cast from the top, on the then accepted English plan. Mr. Holley's mind was not so constituted that he could long follow an beaten track without an effort to do better work on some other line. Thus he introduced the bottom casting of ingots; pouring the steel into a central octagonal mold about 14 inches in diameter at the bottom and 10 inches at the top, from the bottom of which the metal flowed through connecting gates into four surrounding molds $8\frac{1}{2}$ inches square. This plan was adopted after consultations with George Fritz, who had rolls turned to take the $8\frac{1}{2}$ -inch ingots. The central or sprue ingots were hammered into blooms. It was found that the small ingots rolled satisfactorily, while, on the contrary, the central ones cracked badly during working.

This led to much discussion and consultation among the operative officers of the Cambria Company and Mr. Holley, the result of which was that John E. Fry, then superintendent of the Cambria Iron Company's iron foundry, suggested the use of a rammed up center sprue, 4 inches in diameter, connecting through fire brick gates with surrounding ingots; the sprue and gates to be treated as scrap. This plan answered admirably.

While in charge of the experimental Bessemer Works at Wyandotte, Mich., in the interest of the Cambria Iron Company, the writer had developed a manner of bottom-casting ingots. Mr. Holley having protected his plan by a patent, Mr. Fry and the writer united in patenting theirs, and their interests and those of Holley were consolidated. For some years after this practically all bottom casting of ingots in America was licensed under these patents. After a time the price of rails became so much reduced that the loss incident to the scrap of the center sprue and bottom gates made in bottom casting became a serious matter; and while it was and is impossible to cast as sound, and hence as good, ingots from the top, the better plan was abandoned.

At first all the American Bessemer works pursued the English plan of reducing the ingots to blooms under steam hammers. This was so at the Pennsylvania and Troy works. The success in rolling the $8\frac{1}{2}$ -inch ingots at Johnstown led to the invention of the American blooming mill, and this soon completely superseded the steam hammer in rail making.

This idea originated with George Fritz. Holley and he were intimate friends, and exchanged views freely. Holley had severed his connection with the Pennsylvania Steel Company and returned to the Troy, N. Y., Works. There he built a three-high blooming mill. While it had tables, their rollers were not power driven, and the ingots had to be pushed into the rolls and turned over on the tables by hand. Soon after George Fritz built a blooming mill at Johnstown, in connection with a Bessemer converting plant, and put into use his patented ideas of driven rollers, hydraulically controlled movable rolls, and a "turning over and sliding from pass to pass" device, christened by the mill hands a "go devil," which permitted the economic handling of larger ingots. This was the birth of the American blooming mill. In perfecting his plans, George Fritz had the benefit of the advice of his brother John, then manager of the Bethlehem, Pa., Works.

Perhaps these details apply more to rolling mill practice than to the rails themselves, but the writer thinks that they have played a most important part in relation to the character of steel rails, and are pertinent to the subject. Holley started the innovation by which the production of steel ingots has been increased so greatly. Fritz gave the blooming mill, which would not only take care of all that was sent to it from the converting works, but, like Oliver Twist, ask for more; and the late Captain William R. Jones, Robert Forsyth and several others built rail mills which were not satisfied with the amount of steel sent to them by any blooming mill. This has all been magnificent. It has made possible undreamed of low prices for steel rails. It has helped to build railroads, but has it improved the quality of the rails produced?

Steel rails, when first manufactured, replaced iron rails, which, through their deteriorated quality and the increased duty demanded of them, were giving most unsatisfactory service. Some of the early steel rails failed, but most of them were so much better than the best of their predecessors that such failures did not excite adverse comment. They were of what would now be considered light sections, and thus in their production from

the 6 x 6 inch or 7 x 7 inch blooms from which they had been rolled had received much work, and at a comparatively low temperature. In the writer's judgment the greatest factors in the production of good rails are covered by the words "work and temperature." All steel men know that work at high heats does not change the grain of steel at all in proportion to work given at lower temperatures.

Weights of Sections.

For years after the introduction of steel rails a 65-pound per yard section was considered a heavy one. In fact, in America it was the heaviest used, and much the largest percentage was not over 60 pounds. These were rolled from 7 x 7 inch blooms. The ingots from which the blooms were made were generally 12 x 12 inch. After the bloom was formed it was examined carefully after becoming cold, and all cracks and mechanical imperfections were chipped out. Then, after slow heating, with care to avoid too high a temperature, the blooms were rolled into rails by light reductions. While this was being done, if a defect showed itself, the process was stopped until it was chipped out. Now, this slow work at a moderate and steadily decreasing temperature resulted in a fine grained metal, which, of necessity, no matter what may have been its chemical composition, would give greater resistance to the wear of traffic than could be possible from the coarser grained steel which is in the head of the heavier and more rapidly rolled sections of to-day.

By waiting long enough, the things of the past always become the best. That is, provided the past is not examined too closely. It must be remembered that the early rails replaced a much inferior article; in fact, created a revolution in railway maintenance of way. Hence, if a few from any cause failed it excited little comment; they were quietly replaced by others. After a while these failures were forgotten, and the whole lot of existing rails was instanced as an example of what rails should be. Another thing which must not be overlooked is that the early steel rails had the ultimate stress of traffic applied by slow degrees. In other words, the traffic to which they were subjected when first put in service was for them light duty. Heavier rolling stock, faster and more frequent trains, came gradually. The old time rails, which are in these later days so reverently mentioned, had been subjected to a cold rolling process before being given their severest task. To-day an 80-pound is hardly cold before a 175,000-pound locomotive, hauling 100,000 pounds capacity cars at 35 miles per hour, and limited expresses of heavy Pullmans at 60 miles per hour, are thundering over it.

The details of manufacture of steel rails changed, not only in America, but also in England and other countries. This had to be, and it would to-day be as impossible to return to the earlier methods as to restore the service of stage coaches.

Rapidity of American Production.

In 1876 the writer presented a paper at the Philadelphia meeting of the American Institute of Mining Engineers, on "The History of the Bessemer Process in America," and with great pride chronicled the fact that the North Chicago Bessemer Works, under the management of Robert Forsyth, had, in a single month, produced 6457 gross tons of ingots, and that it led the world's records. These ingots were all rolled into rails. To-day the North Chicago Converting Works and rail mill are abandoned, their places having been taken by the present South Chicago plant of the Illinois Steel Company, in which rail mill the largest month's production has been 58,103 gross tons of standard sectioned rails.

The Edgar Thomson Works of the Carnegie Steel Company has made 47,074 gross tons of rails in a calendar month. Other American mills are turning out a large tonnage, but it is believed that the foregoing at present hold the record.

While the faster work of modern practice has somewhat altered the character of the steel in rails, it must not be assumed that the product has been increased without any regard to other considerations. This is not true; on the contrary, the outward character or finish of the rails has been improved to a radical extent. While working fast, the improved machinery is also reliable, and the care exercised in keeping true to section, square sawing, accurate drilling and straightening of both line and surface, yield results which it would have been impossible to obtain in the earlier days. In fact, the requirements of the railways, in consequence of increased weight and speed of traffic, &c., have made it imperative that such finished rails should be given them.

It is not desired to draw any invidious comparisons, but in the writer's judgment American makers are to-day not only turning out the most rails, but at the same time the best finished ones now produced. Moreover, foreign rails, imported into the United States and Can-

ada during late years, have not worn any better than American rails.

The Dudley Investigation.

It has been stated that examining into the past sometimes disproves assumptions. So that, while in the earlier days rail steel and rails were made with all the time and care which has been described, all the rails produced were not satisfactory. In fact, the experience of the Pennsylvania Railroad was such that their chemist, Charles B. Dudley, made an elaborate investigation into the chemical composition of their satisfactory and unsatisfactory rails. His deductions were presented to the American Institute of Mining Engineers, in October, 1878, and elicited a memorable discussion. Dr. Dudley concluded that rail steel could be too hard for good service, even though the rails did not actually break. His conclusions were in favor of chemically softer metal. Some of those discussing the matter thought and stated that the size of the rail sections should be ignored.

As the accredited authority of the great Pennsylvania Railroad Dr. Dudley's views carried added weight, and it resulted in a demand in America for softer rails. The writer thinks that no one to-day will attempt a defense of that position. In fact, the practice did not long prevail. But it cannot be safely claimed that the present rails, whether made in America or imported from Europe, are giving absolutely satisfactory results. They are permitting the accomplishment of work which, but a little while ago, would have been considered an impossibility. Still, if engineers had ever been absolutely satisfied with that which was, progress would have halted. Heavy sectioned rails which will yield better results than those now being obtained are needed. Our railway organizations have generally become so situated financially that they need no longer be limited to the immediate present in the policies of their administrations.

Adoption of Standard Sections.

In the old countries railroads were built because there was a population whose needs demanded them. In this country they were often built because there was a tremendous amount of country and no population. This led to cheap construction; but while we still have plenty of room for more people, our country has become rich enough to justify the best of railroads, and, in fact, imperatively demands them. The successful operation of the roads themselves can be only on such a basis. As the railroads increased in number, and their requirements varied in accordance with their traffic and profiles, and being constructed and operated by many different men, it was natural that not only the weight of rails used, but their sections, should differ. In fact, almost every road had its own particular section. The variations between many were slight, but sufficient to necessitate the use of special rolls in their manufacture. This had become so pronounced, and caused so great an investment of capital on the part of rail makers and loss of time in changing from one section to another, &c., that Mr. Holley, in his characteristic progressive spirit, attacked the situation in a paper presented to the American Institute of Mining Engineers, in February, 1881. In this he stated that, answering his inquiries, the 11 Bessemer mills then making rails in the United States had sent him drawings of 188 patterns which were considered standard ones, and that 119 patterns of 27 different weights per yard were regularly manufactured. Mr. Holley gave drawings of many of these, and pointed out the absurdity of some of the variations. His paper attracted wide interest, but it was a difficult matter to reach. However, its discussion was continued by others later. P. H. Dudley, who had devoted much time to the study of the wear of rails, and who invented a recording car for the examination of the rails, contributed papers on the subject to both the scientific press and societies. Mr. Hawks, then chief engineer of the Michigan Central Railroad, advocated certain sections, as also did D. J. Whittemore, past president American Society Civil Engineers; and the writer also presented a series of sections in a paper read before the American Institute of Mining Engineers, February, 1899.

This society appointed the committee on "The Proper Relation to Each Other of the Sections of Railway Wheels and Rails," which performed its duties in a thorough manner; and following and resulting from its reports, the society appointed a committee to consider and recommend a series of standard rail sections. This was in 1891, but the final report of the committee was not made until June, 1893. During the intervening years the members of the committee had worked faithfully; consulted personally and by correspondence with many of the chief engineers of the railroad systems of the country, and agreed upon all points but one. One member, George S. Morison, differed with the chairman, G. Bouscaren, and with Foster Crowell, Virgil G. Bogue, S. M. Felton, J. D. Hawks, E. T. D. Myers, Samuel Rea, Thomas Rodd, A. M. Wellington, F. M. Wilder and Rob-

ert W. Hunt, as to the width of heads of the proposed sections, and on that point made a minority report.

As secretary of the committee during the latter part of its work the writer knows the difficulties and labors of the task; and naturally is gratified to know that the recommended rail sections are to-day practically the standard ones for American railroads. During 1899, quite 75 per cent. of all the rails rolled by American rail mills were of what are commercially known as the American Society sections.

Use of American Pig Iron.

Geographical and commercial conditions must govern. When the Bessemer process was first introduced in America imported English pig irons were used in making the steel. American irons were experimented with, and gradually displaced foreign irons. This practice first prevailed in the works located west of the Alleghany Mountains. They soon relied entirely upon charcoal pig, made from Lake Superior and Missouri ores. This was much higher in phosphorus than the English irons, but the results obtained from it were so satisfactory that the investigation continued and extended to the use of American mineral fuel irons, both anthracite and coke. After a time these completely displaced both foreign coke and American charcoal brands, in both Western and Eastern works.

It happened that, while the most available Western ores contained percentages of phosphorus fully up to the limit possible for Bessemer uses, the cheapest Eastern ores were quite low in that obnoxious element. Hence, it has been and is a fact that some of the rail makers located east of the Alleghany can produce rails low in phosphorus contents, while using the lowest priced pig metal. The opposite is true of the Western mills. These geographical and commercial conditions have led to the use of entirely distinct chemical specifications in the two districts—at least by some of the leading makers in those districts.

The heavier equipments and higher speeds required more rigid road beds, which could only be obtained by heavier sectioned rails. These were gradually adopted. It was naturally expected that as the sections were increased so would the resulting amount of service yielded by the rails. From the very first the results obtained were disappointing, and the writer doubts whether we will ever succeed in getting results as satisfactory as those yielded by the lighter sections. As the area of the section is increased, so, of necessity, will the work upon the steel in forming it be decreased; and as the resulting mass is enlarged, so will the amount of heat retained in it at the time of the final reduction through the rolls be increased. In the writer's judgment it will be found that the most satisfactory results will be obtained by so modifying the rolling system that the final pass (or better, passes) shall be given after the temperature of the partially formed rail has been lowered. This is not by any means a new idea, but as yet it has not been carried out in a manner calculated to obtain the best results.

Some years ago F. A. Delano, now superintendent of motive power of the Chicago, Burlington & Quincy Railroad, in the interest of that company, had some rails rolled at the South Works of the present Illinois Steel Company, then owned by the North Chicago Rolling Mill Company, on such lines and under his personal supervision. Unfortunately, these rails were of a peculiar section, which was not continued, but the writer believes that the wear of the metal itself was encouraging.

The McKenna Process.

The satisfactory wear being given by rails renewed by the McKenna process at the Joliet and Kansas City Mills of the McKenna Steel Working Company bears very strongly on this point. Mr. McKenna takes rails which have become unfit for further service in main line tracks, from having become rough in surface, through flow of metal, or other causes; or which have become curve worn on the side of the head; and, after carefully removing any fins which have been formed on the upper edges of the heads by metal flow, charges them into a long furnace, and, when heated to not more than 1500 degrees F., they are drawn from the furnace by a mechanical contrivance which at the same time removes any scale which may have formed on their surface, and slightly upsets or flattens the section. The rail is then passed through a set of forming rolls, from which it is carried forward to another set, in which it given a finishing pass. The rail is then sawed hot, and cold straightened and drilled in the usual manner. And while the section has been somewhat reduced the original fishing sections and highis have been maintained.

Now, the steel has been given finishing work at low temperature, and examination has proven that the grain of the metal in the head of the rails has been "fined." But, more important than all, the wear of the renewed rails is promising to be much more satisfactory than that

obtained from new rails of heavier sections. This treatment of rails is no longer in an experimental state, as it is over five years old, and there are nearly 100,000 tons of renewed rails in service on the Chicago, Milwaukee & St. Paul; Atchafson, Topeka & Santa Fé; Wabash and other large systems. One chief engineer, on whose road there are many of these rails, says: "No rail ought to be used at all until after it has been renewed."

The writer has already stated that, owing to geographical, and hence commercial, conditions the chemical specifications under which rails are made differ east and west of the Alleghany Mountains. In the Scranton and Bethlehem district what are known as the New York Central & Hudson River Railroad specifications, which were originally formulated for that road by P. H. Dudley, are regarded as the standard; while for the mills west of the Alleghany a different formula is followed. Some of the main railway systems insist on buying under their own chemical specifications, no matter where made.

Chemical Specifications.

The writer has gone on record so often as believing that in the absence of work at low heats, incident to the present method of making heavy sectioned rails, it is important to increase the carbon with the section to as great an extent as the phosphorus present will permit, without incurring risk from breakage, that it seems unnecessary to repeat the arguments.

At the Atlanta meeting of the American Institute of Mining Engineers, in October, 1895, the writer presented a set of specifications for "Steel Rails of Heavy Sections Manufactured West of the Alleghany." In accordance with these specifications thousands of tons have been made and used with satisfactory results. During the last two years the Western makers have declined to limit the phosphorus to less than 0.10 per cent, but, in fact, have been making steel with a fraction less than that amount, say, 0.09 to 0.085 per cent. And he regrets to say that in many cases they insist that the amount of carbon shall be less than that which he has advocated. He believes, however, that gradually higher carbon will prevail; and, certainly, has not had any cause to change his mind on the subject. His experience as a steel rail maker, and as an observer of the wear of steel rails of many sections and diverse chemical composition, leads him to advocate: 1. Work, after careful heating of the steel, and continued until its temperature has been much reduced. 2. That the carbon percentages shall be increased in proportion to the increase of rail section, the ultimate amount being, of necessity, limited by the contained percentage of phosphorus. In all cases he advocates the use of drop tests on samples from each heat of steel.

At present many of the American railway engineers use the drop test, but none of them demands the static or tensile tests insisted upon by so many engineers of other countries; nor does the writer think there is any necessity for these latter. The chemical analyses and drop tests are all sufficient.

As a matter of record, the writer gives the chemical formulas contained in his specifications of 1895, in accordance with which, as stated, thousands of tons of rails have been made and have given good results. And while at present the Western makers decline to limit their steel to 0.085 per cent. phosphorus, the writer certainly sees no reason to decrease the carbon. In other words, so many rails have been made and proven safe with quite as much carbon as given in the specifications, and with 0.10 per cent. phosphorus, that the writer does not think the former element should be made less, certainly not until the details of manufacture have been changed.

The standard specifications of the Louisville & Nashville Railroad Company are also given, as they cover both Bessemer and basic open hearth steel rails.

The so-called New York Central & Hudson River Railroad Company's specifications are also appended; and the present standard specifications of the Western rail mills.

Robert W. Hunt's Specifications.

Section 8.—The carbon in the 70-pound section shall not be below 0.43 per cent. nor over 0.51 per cent. In the 75-pound section not less than 0.45 per cent. nor over 0.53 per cent. In the 80-pound section, not less than 0.48 per cent. nor over 0.56 per cent. In the 90-pound section, not less than 0.55 per cent. nor over 0.63 per cent. In the 100-pound section, not less than 0.62 per cent nor over 0.70 per cent.

The phosphorus shall not exceed 0.085 per cent.

The silicon shall not be below 0.10 per cent.

The remainder of the chemical composition of the steel to be left to the maker's judgment.

Louisville & Nashville Railroad Specifications.

The steel used for rails shall contain carbon as follows: For 58½-pound steel rail from 0.42 to 0.52 of 1 per

cent; for 70-pound steel rail 0.47 to 0.57 of 1 per cent., and for 80-pound steel rail 0.55 to 0.65 of 1 per cent., and not more than 0.085 of 1 per cent. of phosphorus, nor 0.07 of 1 per cent. of sulphur. Silicon, 0.15 to 0.20 of 1 per cent.

When the steel used for the rails has been made by the basic open hearth process it should be of the following chemical composition; for 58½-pound steel rail, from 0.45 to 0.52 per cent. of carbon; for 70-pound rail, 0.50 to 0.57 per cent.; for 75-pound rail, 0.55 to 0.60 per cent.; for 80-pound rail, 0.62 to 0.67 per cent. The steel used for all rails shall contain silicon from 0.10 to 0.20 per cent., 0.15 per cent. being preferred; manganese, 0.90 to 1 per cent.; phosphorus, not to exceed 0.05 per cent.; sulphur, not to exceed 0.5 per cent.

New York Central & Hudson River Railroad Specifications.

	65 pounds.	70 pounds.	75 pounds.	80 pounds.	100 pounds.
Carbon.....	0.45 to 0.55	0.47 to 0.57	0.50 to 0.60	0.55 to 0.60	0.65 to 0.70
Silicon.....	0.15 to 0.20	0.15 to 0.20	0.15 to 0.20	0.15 to 0.20	0.15 to 0.20
Manganese.....	1.05 to 1.25	1.05 to 1.25	1.10 to 1.30	1.10 to 1.30	1.20 to 1.40
Sulphur.....	0.069	0.069	0.069	0.069	0.069
Phosphorus.....	0.06	0.06	0.06	0.06	0.06
Rails having carbon below will be rejected...	0.43	0.45	0.48	0.53	0.60
Rails having carbon above will be rejected.	0.57	0.59	0.62	0.65	0.70

Specifications of the Western Rail Mills.

	50 pounds up to 60 pounds.	60 pounds up to 70 pounds.	70 pounds up to 80 pounds.	80 pounds up to 90 pounds.	90 pounds up to 100 pounds.
Section 1. Carbon.....	0.35 to 0.45	0.38 to 0.48	0.40 to 0.50	0.43 to 0.53	0.45 to 0.55
Phosphorus.....	not over 0.10	not over 0.10	not over 0.10	not over 0.10	not over 0.10
Silicon.....	not over 0.30	not over 0.30	not over 0.30	not over 0.30	not over 0.30
Manganese.....	0.70 to 1.00	0.70 to 1.00	0.75 to 1.05	0.80 to 1.10	0.80 to 1.10

Discussion.

The discussion which followed the reading of this paper was participated in by Albert Ladd Colby of South Bethlehem, Pa.; Wm. R. Webster of Philadelphia, President John F. Wallace of the American Society of Civil Engineers, and Sir Lowthian Bell of Middlesbrough, England. A point of much interest brought out was the fact that low phosphorus does not appear to have the importance in rail steel that has been supposed. European specifications generally call for phosphorus to be 0.06 per cent. or less; but American mills increase this limit to 0.10 per cent. and nearly all American railways accept such rails and they are giving good results in service. Both Mr. Wallace and Sir Lowthian Bell gave instances of rails which had given exceptionally long service being analyzed and found to be very high in phosphorus.

In closing the discussion, Mr. Hunt stated that both the Carnegie Steel Company and the Illinois Steel Company have plans prepared for alterations to their mills which will enable them to finish all rails at a low heat, and these alterations will be made as soon as the works can be shut down long enough for the changes to be made.

The Corrosion of Steel Cars.

Referring to the corrosion occurring in the plates used in the steel cars made by the Pressed Steel Car Company of Pittsburgh, it is stated that so long as the cars meet with ordinary conditions the corrosion is very slight and the percentage indicates that the life of a car would exceed 20 years. This relates only to the floor, as the rest of the steel in the car will last a considerably longer period. That the corrosion is slight is evidenced by the tenders attached to locomotives, the material there used being only ¼ inch thick and the coal being wetted down constantly, yet the life of a tender is from 10 to 12 years. Regarding the cars in which corrosion of the steel plates has been reported, it is stated that officials of the Pennsylvania Railroad, upon investigation, found that these cars had been standing on a side track loaded with coal for a period of seven months, experiencing all sorts of weather, and even then the corrosion did not amount to more than a thin rust, which was readily removed and obliterated by a coating of paint. Taking this as a basis, the claim that a pressed steel car, under ordinary conditions, will last for 20 years or longer would seem to be a very conservative one.

The Richmond Locomotive Works have just received by cable an order from the Finland State Railways for 12 16 x 24 inch ten-wheeled passenger locomotives. This is the third order for engines received by the Richmond Works from the Finland State Railways, and is an illustration of the increasing demand for American locomotives abroad.

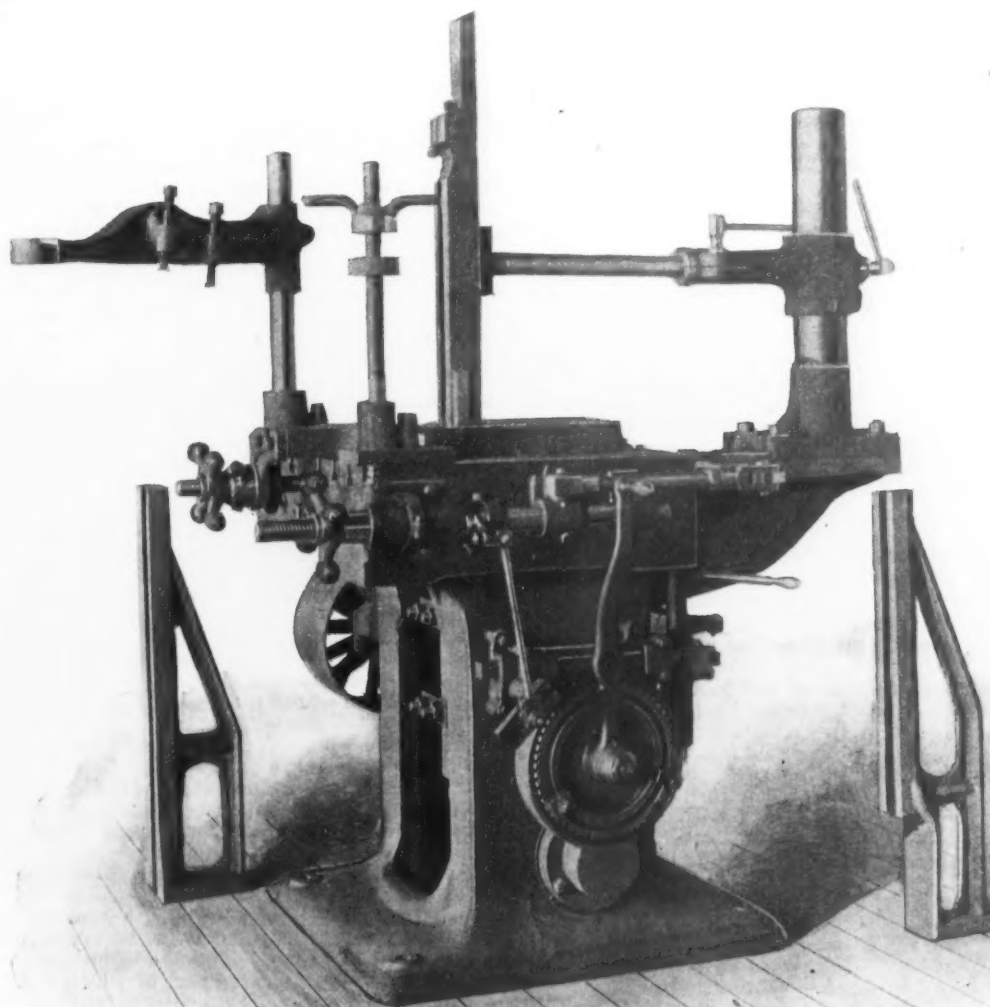
The Morton Stationary Key Way Cutter.

The accompanying illustration shows the Morton 20-inch stroke standard stationary key way cutter, which embodies novel features. The construction is of the box column form, the column being ribbed and cross ribbed, so that it is thoroughly supported through to the foundation under the machine, with the metal so distributed as to give it the most rigid construction. The table is tongued and grooved and securely bolted to the top of the column and is of special construction, being what might be termed double thick. This is also ribbed and cross ribbed and so designed that it would represent a body of metal through to the foundation of the machine.

The main journals are fitted into bored holes in the column and the adjustable guide is journaled on the out-

tion is such that the countershaft may be easily placed on the floor at the rear of the machine or can be placed at an angle of 45 degrees or directly above the machine.

The stroke is adjusted by means of tappets on a circular disk, and is provided with a reverse lever, located in reach of the operator, whereby it can be reversed at any part of its stroke. The top or gauge plate is an auxiliary plate placed on top of the table and supplied with jaws which come up on either side of the cutter bar located centrally with the cutter. These jaws are adjustable to the different sizes of cutter bars and are very quickly changed. The projections on these jaws form a centering device by which the work is centered by the bore of the wheel or pinion being cut. This top plate is also provided with a micrometer adjustment so that the machine may be set to cut key seats of the given depth without the use of a rule. The taper and depth are



THE MORTON STANDARD STATIONARY KEY WAY CUTTER.

side of these. It is provided with a steel rack and steel pinion for the main drive and the rack is located central of the cutter bar, thereby overcoming entirely any side strain. The cross head is constructed with square rail bearings and ample means for taking up wear.

The adjustable guide is journaled at its upper extremity in the table and provided with a movable bearing secured to the top of the guide, which forms a bearing immediately underneath the table, no matter what position the cross head may be in. The extension guide, which forms a bearing above the work as well as below it, is of very rigid construction, the base, arms, &c., being of suitable diameter and strength to be rigid, and it is of easy adjustment. By simply loosening the binding nut it can be swung around to receive and remove work.

The machine gets its reciprocatory motion by the employment of open and cross belts and has a quick return of three to one. The belt shifting is of such design as to throw the driving belt entirely from the tight pulley before the driver is shifted on, and the special construc-

all controlled by the feed hand wheel, the graduations for taper being shown on the side of the top plate, it being graduated to represent $\frac{1}{8}$ or $\frac{1}{4}$ inch taper to the foot, the taper being made deeper either at the top or bottom of the work.

The machine is stopped and started instantly by means of a friction clutch (small lever shown at the right side), which is under complete control of the operator and which is one of the most essential features of a key seating machine. It is provided with an automatic feed which derives its power from the crank and pinion engaged in a rack in the shipper, the bar being of such a ratio that the crank will make one-half revolution when in operation. This is connected with a friction feeding mechanism and sleeve by which the power is transferred to the ratchet on the hand feed wheel. It will be readily seen, as the machine reverses at the end of the stroke, that the feed is made to operate almost instantaneously much closer than the operator could possibly feed by hand.

The cutter bars are all made of crucible hammered steel and are made flat, so that should they become worn on the back side they can be planed and refitted at a slight expense. The smallest sizes of bars are fitted into a special chuck by which they can be easily and quickly removed from the machine. The cutters are all made of a special grade of steel and are on such an angle as to cause the machine to take its cut without placing any more strain than is absolutely necessary on the working portions. The cutter bar is provided with an automatic relief, which is also controlled by the shipper device, which allows sufficient relief for the cutter to return its stroke without injuring its cutting edge. With this application the machine can be fed automatically in key ways of any width, and when it comes up to the required depth the stop collar located on the feed screw makes the friction feed slip so that it is impossible for the machine to cut a key seat any deeper than the automatic feed will allow it. This is a desirable feature when key seating steel and other work, as it leaves the operator entirely free to lubricate and attend to the cutter.

The special construction of the feed and other actuating mechanisms of this machine are such that the work remains stationary or fixed on the table, there being no sliding or other bearings which are liable to wear and lose their alignment when subjected to the strain of a heavy wheel placed upon the table. Under this particular construction the machine will feed and operate just as easily when cutting key seats in a 10-ton gear as it will in the smallest piece of work, and as the main driving pinion and rack are located centrally with the cutter bar there is no side strain to cause the same to lose its alignment.

The improved rapid binding attachment is very rigidly constructed. One screw will successfully secure the work, and, with it, pieces of couplings, gears and other work of this nature can be very rapidly placed. The table is also provided with T-slots for securing the work for which the binder is not adapted. The gearing throughout the machine is all cut from the solid, and the bearings are large and long.

This machine is designed and built by the Morton Mfg. Company, Muskegon Heights, Mich.

Lake Iron Ore Matters.

DULUTH, MINN., July 28, 1900.—There is some discussion of the effect to be produced by the settlement of ore prices for the remaining half year at earlier prices. So far as can be determined at this end of the trade the effect will be to stimulate the sale of non-pool ore, of which a very considerable quantity might be produced if occasion warranted, even in the remainder of this year. A good deal of non-pool ore was sold last fall and winter at prices somewhat under the pool price per unit, but at a figure that now, when compared with the drop in finished materials, looks quite sufficient. Besides the large interest outside the pool there are some other producers that might be depended on for production if necessary.

New mines are not coming into line as fast as had been expected earlier in the year, and some that were to ship ore this year will not do so. A fire at the new Fay mine, Mesaba range, one day this week destroyed all surface improvements and stopped all probability of shipments from there this season. The mine would not in any case have sent out very much. Some Menominee and Marquette properties that were to ship this year have also been hauled out of line.

A new village, Sharon, is starting at the mines of the Sharon Steel Company, on the West Mesaba range. It lies south of the mine and has in its vicinity not only this mine, but the Benjamin property of the Lake Superior consolidated mines and some others, in all a body of ore 1 mile long and of very considerable depth. Drake, Stratton & Co. are commencing to strip 400,000 cubic yards at the Sharon under a contract just made, and a large number of men are employed at mine and village. The adjoining property of the Consolidated will not be opened for some indefinite time, but other owners will probably develop before very long.

A splendid mine has been developed for the Chandler Iron Company during the past few months on what is known as the Rahilly tract, in contiguous portions of sections 22, 23 and 27, township 58, range 20, about 5 miles east of Hibbing. The option was secured by O. D. Kinney and G. C. Howe of P. H. Rahilly for a lease at 20 cents a ton on a minimum of 100,000 tons, and from two to four drills have been working there for some months. A large and high grade Bessemer deposit has been opened into, estimated at about 15,000,000 tons and averaging about 62 or 63 iron, and as low as 0.020 in phosphorus for a large part of the body, all being well within the Bessemer limit. The original option holders are to receive \$150,000 as bonus from the Chandler Iron

Company and the deal will be closed in a short time. The mine is one of the best yet discovered on the Mesaba, so far as grade and characteristics go.

In the southern part of town 59, range 14, where ore was found some months ago, as then reported, there are many additional developments, and it is very evident that this will be one of the important townships of the range. The Minnesota Iron Company have many of the best deposits so far discovered, though additional finds are being made by O. D. Kinney and C. E. Shannon and others. The Minnesota Company have gone through the taconite on some of their finds here and have run into ore below it in quantity, so that there is far more ore there than was supposed.

New knowledge is coming along to the explorers of the Mesaba range and old ideas are changing fast and decidedly. Not long ago it was supposed that if a drill went into taconite 1 or 2 feet there was no further need of work, and many an exploration has been abandoned and the land condemned because of the discovery of taconite before ore was run into, or under a shallow layer of ore. Now the situation is different. Two years ago ore was found under a depth of 70 feet of taconite by an explorer who was thought to have more curiosity than knowledge, and since then the Sharon Mining Company found under a few feet of the same rock their best ore. This has been found to be the case at a number of other properties, and it is now generally recognized that ore under the taconite is likely to be better than that above it. In the Virginia district the fact has been proved the past year in several cases, and now an explorer has sunk there to the depth of 80 feet, finding good ore below. This is the greatest depth undertaken. The facts are of importance to explorers on this range and indicate a much greater possibility of good ore than had been looked for; in fact, the previous estimates of the range are likely to need revision and much drilling will have to be done over again.

At their Lake Fumee exploration, near Quinnesec, the Oliver Iron Mining Company have decided to sink a shaft very soon, to tap a large body of ore they have found there. Several permanent buildings are completed. At the American Mining Company's Hilltop, at Crystal Falls, considerable underground work is being done, but shipments are very light. The company are not mining heavily at many of their locations. The Appleton exploration, which has a shaft 200 feet deep, is being unwatered and will be explored. The James exploration, near Iron River, is being pushed down, as also at the Seldon. At Lotta a shaft is being sunk.

It has been fortunate for the Lake Superior district, and especially for Ishpeming and Marquette, that there have been at the head of the Cleveland Cliffs Iron Company such men as have guided them in the past 50 years. The recent semicentennial of the company brought out such a showing of loyalty, and so many evidences of the rare and truly Christian feeling between employer and employee, as to show that the company's management has been unique in the history of American mining concerns. The company have about 2000 men on their pay rolls in all departments of work, more than ever before. They have had some 50 men continuously in their employ for 20 years, and they have been a training school for experts of all kinds, so far as mineral is concerned, who are now to be found in all parts of the globe. They have some 125,000 acres of land, a large part of which is mineral, the rest timber, and they propose to utilize both mineral and timber for the best upbuilding of the communities in which they are located, as well as for their own advancement. The company are the largest independent mining concern in the country, control transportation to the lower lakes, and are also producers of a considerable tonnage of charcoal pig iron. In their land ownership they are second among mining companies only to the Minnesota Iron Company, who control about 150,000 acres on Minnesota ranges.

The Detroit & Lake Superior Graphite Company have decided to establish a graphite mill and works at L'Anse, at the head of Keewenaw Bay, near the old Taylor mine, and 7 miles south of L'Anse they have a large deposit of what is said to be fine graphite, and this they will bring to the village for treatment.

The American Mining Company are preparing to open on their Sauntry location, Mesaba range, a new mine. They will strip an ore body and operate it by the milling process. This is a mile southeast of the present stripped mine they are working in. Ore enough to make a mine has been found under the schoolhouse site at Hibbing and the Consolidated Company will open there in time. A strike of high grade ore has been made at a point about 4 miles northeast of Hibbing by Fay and others.

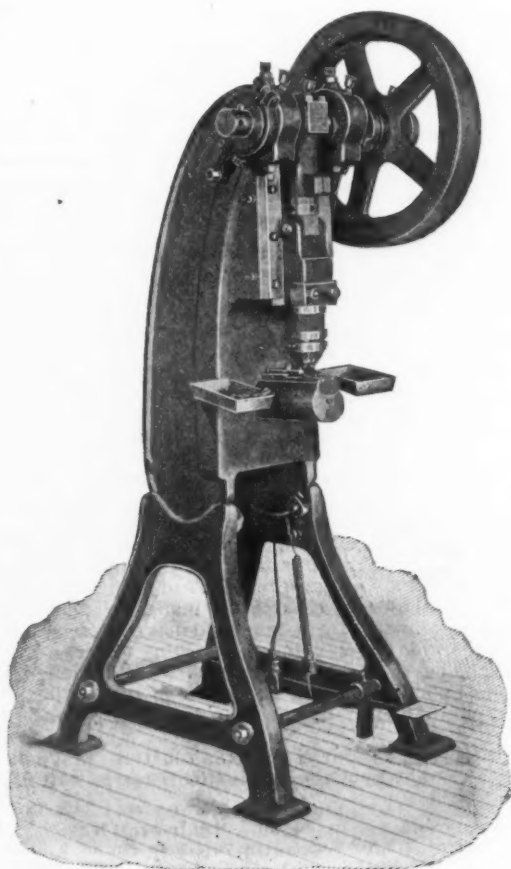
D. E. W.

The Auditing Committee recently appointed to audit the books of the Amalgamated Association have completed their work and will make a recommendation for a re-

duction in the expenses entailed by the frequent wage conferences with the manufacturers. The organization has to pay the members of these committees for their time, as well as their expenses. It is proposed to reduce the cost by reducing the number of members on the committees.

The Weber Riveting Press.

The inclinable power press here illustrated is designed for riveting all kinds of light sheet metal. The shaft is set in removable and adjustable boxes, and is made of a steel forging. The wheel is bushed and fitted with a steel key for the clutch to act on. The ram is long and scraped to fit the V-shaped adjustable gibs. Hardened clamping studs and nuts hold punch shanks 1 7-16 to 1 9-16 inches in diameter. The four-point contact insures the punch being held firmly in true alignment. The safety clutch is a modification of the tilting



THE WEBER RIVETING PRESS.

bar type, which has been used for many years by press manufacturers. An eccentric on the clutch collar disengages the foot treadle immediately after the press starts so as to allow the latch to return to the stopping position, regardless of the treadle being still depressed, so that it is impossible for the machine to make a second revolution until the treadle has been again raised and depressed. The distance from the back to the center of the slide is 5 inches; from the horn to the bottom of the slide when the latter is up is 8 inches; the length of the slide is 13½ inches, and the stroke 1½ inches. The weight of the press, which is built by the Weber Safety Press Company of St. Paul, Minn., is 1100 pounds.

The Norfolk Shipbuilding & Dry Dock Company of Norfolk, Va., incorporated some months ago with J. Andre Mottu as president, have decided to locate their plant at Old Fort Norfolk. It will include an 800-ton cradle 150 x 46 feet, a 600-ton cradle 125 x 46 feet for barges, a 2500-ton cradle 280 x 76 feet; back of the cradles will be the railway power house, plate shop 80 x 50 feet, machine shop 100 x 50 feet, blacksmith shop 75 x 30 feet, power house for the entire plant 55 x 30 feet and saw mill 150 x 50 feet. There will be a building slip for 300-foot ships, 90 feet wide. The company also contemplate at a later date the construction of a dry dock 90 feet wide. About \$250,000 will be expended in these improvements.

To Avoid Labor Troubles in Illinois Coal Mines.

An important organization has been formed in Illinois, named the Illinois Coal Operators' Association, of which Herman Justi is commissioner, with offices in rooms 1002 and 1003, Ellsworth Building, 355 Dearborn street, Chicago. A prospectus just issued by Mr. Justi states that "the Illinois Coal Operators' Association is possibly the first voluntary organization in this country of men engaged in industrial pursuits on a large scale to attempt, as it is attempting now, to prevent friction and to settle disputes with its employees by submitting its differences to a commission of its own choice, whose business it will be to take them up with the representatives of the union—the officials of the Mine Workers' Union—and settle them upon their merits solely."

This prospectus outlines the methods which will be followed in the management of the labor question, and closes as follows: "Any reference to arbitration has been purposely omitted in the foregoing prospectus for what is believed to be an excellent reason—viz., that if conciliatory measures are promptly and wisely applied arbitration is rendered unnecessary and a strike becomes only a remote possibility. If, however, the officials of the Mine Workers' Unions and the commissioner of the Illinois Coal Operators' Association cannot reach a satisfactory agreement, then arbitration will be proposed as a possible solution of existing disputes or differences."

The Troy Steel Company.

Attorney-General Davis gave a hearing on the 26th ult., at Albany, N. Y., in the matter of the application of Alfred J. S. Swett of Troy, asking the Attorney-General to commence an action in the Supreme Court for the dissolution of the Troy Steel Company and the appointment of a receiver, on the ground that the company had failed to pay up their indebtedness and had also failed to operate their plant within a period of two years. Benjamin E. De Groot of New York appeared for the petitioner, and Julius F. Workum, representing the New York City firm of Reed, Thatcher, Simpson & Barnum, looked after the interests of the company.

Mr. Workum denied that the company's business had been entirely suspended, claiming that one of the plants had been leased, but to what firm he did not state.

The Attorney-General gave counsel until September 15 in which to file briefs.

Steel Grain Elevators.—The substitution of steel for wood in the construction of grain elevators is likely to become general if the example of the Great Northern Railway Company is followed. This company are building a steel grain elevator of 2,500,000 bushels capacity at Superior, Wis., and Vice-President W. L. Hill, in discussing the subject, is reported to have said that "the saving by reduced insurance, &c., in a steel elevator will more than make up the difference in interest on the cost of the steel house, though it will cost twice as much per bushel as the wooden structure. The new steel elevator will be of 2,500,000 bushels capacity and will probably be ready for operation in 1902. The Great Northern road will then have 7,000,000 bushels capacity on the Duluth market, all but 1,800,000 of which will be the most modern steel construction, operated electrically."

The McCloud, Crane & Minter Company, manufacturers of iron, steel and brass milled machine screws, and the Anthony-Bates Machine Company, manufacturers of finished case hardened and semifinished nuts, both at Worcester, Mass., will be consolidated in the near future. The stock of the former company, which had come into the market through the death or retirement of the chief owners, has been purchased by parties interested in the latter, who have effected a new organization and chosen the following officers: President, Edward M. Anthony; treasurer, Albert H. Anthony, and secretary, J. Walter Smith, who, with Mrs. A. A. Gardner, constitute the Board of Directors. The machinery equipment of the Anthony-Bates Machine Company is now being removed to the works of the McCloud, Crane & Minter Company. The latter name will be retained, but the details as to capitalization have not yet been decided.

A special meeting of the stockholders of the Danville Bessemer Company, Danville, Pa., will be held shortly, to vote on the matter of selling the plant and dissolving the company. On March 31, 1900, they had \$247,019 in cash, \$114,140 in bills receivable and \$124,141 in materials, a total of \$485,300. Three months' expenses have reduced the cash somewhat. Besides these assets there is the plant, clear of debt. There are 240,000 shares of stock.

Canadian News.

Nova Scotia Iron Deposits.

Iron deposits in the county of Antigonish, Nova Scotia, are engaging the attention of some parties in New York. They have lately been visited by George B. Cowlam, who is vice-president of the Interstate Finance Company. His views as to the possibilities of the property have been communicated to the *Montreal Star*. The range in which the ores occur is about 9 miles in length and about 1000 feet high. It runs northwest and southeast, roughly parallel to the coast of Northumberland Strait and $2\frac{1}{2}$ miles distant therefrom. The range is cut by a stream, known as Doctor's Brook, 2 miles from its northern end. On both sides of the gorge thus made several veins have been uncovered, the correspondence between the two sides being in this respect complete. According to Mr. Cowlam's estimate the quantity of ore in this body is vast. He describes the ore as bluish hematite in the larger veins; two of the smaller veins, however, contain what seem to be Clinton ores, like those in Alabama, but Mr. Cowlam considers them of higher grade. From several analyses made he places the average yield of metallic iron at 53 per cent., and the phosphorus 0.212 to 0.53. A projected railway 35 miles long between Antigonish and the iron mountain runs through a field of good coking coal. There being plenty of limestone at Antigonish he thinks that pig iron could be made there at a cost nearly as low as in Alabama. The Nova Scotia coke would be poorer than that used in the Southern furnaces, but the ore, he holds, would be richer than that of the South. He predicts great developments from these deposits. With proper facilities at Arisaig, he calculates ore could be mined, landed at the pier and loaded into vessels at a cost of 40 cents a ton; at Antigonish for less than 50 cents, and at the Straits of Canso for 60 or 65 cents a ton. The ores are found in solid, vertical veins, having walls of pure grained trap rock or metamorphosed sandstone, and these veins occupy the center of the ridge.

Michipicoton Ore Shipments.

On the 22d inst. the steamer "Theano" of the Algoma Central Steamship Line arrived at Midland with 1940 tons of ore from the Helen Mine, the cargo being for the Canadian Iron Furnace Company's charcoal iron blast furnace at that point. J. J. Drummond, superintendent of the Canada Furnace Company's Works there, says that he expects two or three cargoes a week until the close of navigation. This is the first vessel load of iron ore ever taken out of the Michipicoton District. On the Algoma Central short line, between the Helen Mine and the ore docks at Michipicoton harbor, the first six of the new 50-ton ore cars are in commission, and 500 tons are being forwarded daily to the harbor.

E. V. Clergue, who has charge of the operations at the Helen Mine and the harbor, was in Toronto on the 25th inst. He says it is the intention of the company to double the force of employees at the Helen Mine in a few weeks. Two hundred and fifty hands, he says, are engaged in the mine now.

A New Head for Ontario Bureau of Mines.

Archibald Blue, chief of the Ontario Bureau of Mines, has been appointed Commissioner for taking the Dominion Census of 1901. He enters the service of the Dominion at once. The position he vacates at the head of the Bureau of Mines will be filled by promotion, Thomas Gibson, his present assistant being, it is understood, fixed upon as his successor. Mr. Blue has been Director of the Bureau of Mines since 1891, and the annual reports prepared by him have been of very considerable value. Nearly all the important new Ontario mineral deposits, which are now being worked, or to which railways are being run, or which are objects of attention in any way, have come into their prominence since he took charge of the bureau. No little credit is due to him for what progress has been made in the development of the Province's mineral resources. He was a member of the Royal Commission, appointed in 1888 to inquire into the mineral resources of Ontario. The report of that commission is still the standard authority as to the distribution of minerals in Ontario.

Iron in Nipissing.

Professor Miller, who is exploring the District of Nipissing, along a continuation of the jasper bands, traced across Algoma by Dr. Coleman, reports in a letter that he is at work about Lake Temagami, and has proved the relationship of a number of jasper bands to iron ore deposits. It seems probable that the jasper is more widely distributed in that district than in Algoma, whence it is believed Nipissing is the richer district in iron.

Minor Notes.

It is expected that the Midland Furnace will be ready to be blown in in the latter part of August.

Notice was given to the employees of the Hoeffner Refining Company some days ago that their services would be no longer required under the contracts with Dr. Hoeffner. It is understood that this move is taken for the purpose of quickly closing up the affairs of the Hoeffner Company and getting the Nickel-Copper Company into working order.

The Town Council of Midland presented the captain of the "Theano" with a silk hat, as a compliment to him for landing the first cargo of iron ore at that port.

New rails for the Cape Breton section of the Intercolonial Railway are being landed at Mulgrave from the steamer "Chatten." The rails were bought in England.

It is said that 25 coke ovens on the new German improved pattern will be built before winter, near Winning Pit, Cape Breton.

The boiler makers' strike in Montreal is unchanged. At a general meeting of the strikers, on the 25th inst., a letter was received from the Glasgow union of boiler makers offering £950 to aid the strike.

There has been a considerable rise in the price of coal at Halifax. Soft coal there is \$1 per ton dearer, and hard coal 50 cents more than it was a year ago. In consequence of the better demand, it is said that the Dominion Coal Company are considering the advisability of reopening the Victoria Mine, which they closed down two years ago.

C. A. C. J.

Duty on Carolina Hoes.

The following decision was rendered by the United States general appraisers, at New York, July 23, relative to the duty on hoe blades, partially made by the forging process, then ground and painted:

"The articles in question are described in the invoices as 'Carolina hoes.' They consist of metal blades ready to be attached to a wooden handle, when they will be ready for use as an implement of husbandry. They were returned by the local appraiser as 'manufactures of metal not otherwise provided for,' and duty was assessed thereon at the rate of 45 per cent. ad valorem under the provisions of paragraph 193 of the act of July 24, 1897.

"The importers claim that the goods are forgings and subject to duty at the rate of 35 per cent. ad valorem under the provisions of paragraph 127 of said act.

"These blades are partially made by the forging process, but in the form imported have been subjected to considerable labor after the forging process is completed, being first ground to an edge and then having the upper portion painted black, the lower portion being left unpainted and showing the polished ground steel. In their imported form they are not forgings, as that term is used in the tariff act. (*Saltonstall vs. Wiebusch*, 156 U. S., 601.) In that case Justice Brown, writing the opinion, said:

"But we do not understand the term 'forgings' to be applicable to articles which receive treatment of a different kind than hammering before they are complete; such, for example, as grinding, tempering, or polishing.

"It is not in evidence what percentage of the cost the processes or labor outside of the forging amounted to, but the fact is unimportant. As was further said in the *Saltonstall* case:

"The fact that the further process which the articles specified underwent represented but 3 or 4 per cent. of the total labor expended upon them is by no means decisive, when it is a question of classification, since the object of Congress may have been to protect the additional labor.

"The protestants further claim in their protests that these articles are only partially manufactured, requiring the attachment of handles before they can be used. This fact, however, will not change their classification, for they are parts of implements and not forgings, and are dutiable as manufactures of metal, there being no more specific provision of the tariff that will apply. (*Saltonstall vs. Wiebusch*, *supra*.)

"For the reasons above given, we find that the goods in question are not forgings, but are manufactures of metal, and accordingly overrule the protests and affirm the decision of the collector."

Shipments are now being made by the Bullock Electric Mfg. Company, Cincinnati, Ohio, on the \$500,000 contract made with a French syndicate some time ago for the electrical equipment of street railways in various parts of the Eastern Hemisphere. Two large street railway 800-kw. generators have been consigned to Alexandria, Egypt; a 400-kw. generator to Algiers. A large generator is also being shipped to Lyons, France; also five carloads for the Russian-Chinese Railroad. A large lot of work is under way for the United States Government in the Philippines and a large printing press outfit for St. Petersburg, Russia.

The Iron Age

New York, Thursday, August 2, 1900.

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JOHN S. KING,	- - - - -	BUSINESS MANAGER.

Our Enormous Production of Pig Iron.

The monthly statements published in *The Iron Age* of the producing capacity of the active blast furnaces in the United States keep the iron trade well informed of the rate at which pig iron is being turned out. Nevertheless, it is a great satisfaction to have at the expiration of each half year an official statement of the exact production during that time. The statistics of this production have just been issued for the six months ended June 30 by James M. Swank, general manager of the American Iron and Steel Association. They show that the United States turned out in that period the huge quantity of 7,642,569 gross tons of all kinds of pig iron, including spiegeleisen, which is at the rate of considerably over 15,000,000 tons for the year. As the production in the last half of 1899 was 7,331,536 tons, the production for the 12 months ended June 30 was 14,974,105 tons, or only 25,895 tons short of 15,000,000 tons. This is a very conclusive answer to those who have been figuring that the consumptive requirements of the country had grown to about the 15,000,000-ton mark and wondered how they were to be met. The production for the last half year would undoubtedly have been still greater but for the reaction in the iron trade that set in during April. If the demand for iron had continued, more furnaces would have gone in blast in the spring months, fewer would have been blown out and the completion of new furnaces under way would have been hastened. It appears now that the figures for the past 12 months will represent high water mark in our pig iron production for some time, but we will have the capacity to considerably exceed it whenever the demand calls for a larger supply. It is interesting to note in this connection how the production of the country has grown by half-yearly periods in the last decade. The following figures illustrating this growth have been taken from the statistical reports of the American Iron and Steel Association:

Our Pig Iron Production by Half-Yearly Periods.

Calendar years.	First six months. Gross tons.	Second six months. Gross tons.	Total. Gross tons.
1890.....	4,560,513	4,642,190	9,202,703
1891.....	3,368,107	4,911,763	8,279,870
1892.....	4,769,683	4,387,317	9,157,000
1893.....	4,562,918	2,561,584	7,124,502
1894.....	2,717,983	3,939,405	6,657,388
1895.....	4,087,558	5,358,750	9,446,308
1896.....	4,976,236	3,646,891	8,623,127
1897.....	4,403,476	5,249,204	9,652,680
1898.....	5,869,703	5,904,231	11,773,934
1899.....	6,289,167	7,331,536	13,620,703
1900.....	7,642,569		

The increase in the production of pig iron has not been confined to one kind of fuel, but all classes have participated in the gain made in the last three half-yearly periods, as shown by the following table:

Production According to Fuel Used.

Fuel.	First half 1899. Gross tons.	Second half 1899. Gross tons.	First half 1900. Gross tons.
Bituminous	5,478,655	6,257,730	6,459,714
Anthracite	682,027	917,525	990,667
Charcoal	128,485	156,281	167,146
Charcoal and coke.....			25,042
Totals.....	6,289,167	7,331,536	7,642,569

The production of Bessemer pig iron was 4,461,391 tons in the first half of this year, against 4,413,871 tons

in the last half of 1899, and 3,788,907 tons in the first half of that year. A similar comparison of the production of basic pig iron shows 581,868 tons, 502,644 tons and 482,389 tons. The production of spiegeleisen and ferromanganese in the first half of 1900 was 148,102 tons, against 104,496 tons in the first half of 1899 and 115,272 tons in the second half.

Figures are presented for stocks of pig iron on hand at the blast furnaces. These stocks include all iron unsold in the hands of manufacturers or their agents and in the yards of the American Pig Iron Storage Warrant Company, but not any iron sold and not removed from the furnace yard or manufactured by steel works or iron rolling mills for their own use. On this basis the stocks reported on June 30 total 338,053 gross tons, or eight days' production, against 63,429 tons December 31, 1899, and 81,220 tons June 30, 1899.

Our Foreign Iron and Steel Trade.

The Bureau of Statistics of the Treasury Department has just published the report of our foreign trade for the fiscal year ended June 30, which gives us another opportunity to study the extent to which the United States is supplying the world at large with iron and steel and other metal products. It had been supposed that the very high prices ruling for iron and steel in the closing months of 1899 and the early part of 1900 would seriously check our export trade, but the figures just published disprove this presumption. While some falling off occurred in the cruder forms of iron and steel, the stream of exports in other forms swelled to larger proportions. The higher prices realized more than offset such falling off as occurred in the quantities exported. The total values of exports of all the merchandise classified under iron and steel and manufactures thereof have been as follows for the past three fiscal years:

Total Exports of Iron and Steel and Manufactures.

Year ended June 30, 1898.....	\$70,406,885
Year ended June 30, 1899.....	93,716,031
Year ended June 30, 1900.....	121,858,344

The fact that these exports have continued to increase this year is shown by referring to similar figures for the calendar year 1899, during which the total value of such exports was \$105,689,645.

Turning to the details of exports in the fiscal year, and taking those for which tonnage figures are presented, we have the following comparison:

Exports of Iron and Steel in Fiscal Years.

Commodities.	1898. Gross tons.	1899. Gross tons.	1900. Gross tons.
Pig iron.....	228,465	299,146	160,674
Ferromanganese	8,403	495	16
Scrap iron and steel.....	60,195	91,985	48,110
Bar iron.....	4,769	10,519	8,240
Steel bars and rods, except wire rods.....	16,864	32,974	32,623
Iron rails.....	2,769	11,776	6,149
Steel rails.....	229,783	266,109	341,646
Steel billets, ingots, &c.....	16,100	43,124	14,084
Hoops and bands.....	1,552	3,015	1,316
Wire rods.....	14,469	25,219	11,598
Iron plates and sheets.....	4,057	6,744	8,117
Steel plates and sheets.....	12,215	50,308	35,502
Tin plates.....	9	92	143
Structural iron and steel.....	30,586	49,069	56,265
Wire.....	61,185	96,069	105,747
Cut nails and spikes.....	14,424	14,674	11,132
Wire nails and spikes.....	10,221	22,854	37,784
Other nails and tacks.....	1,922	2,062	1,916
Totals.....	717,988	1,026,234	881,062
Iron ore.....	11,537	31,412	40,510

It will be observed that, as compared with the previous year, the exports of pig iron, ferromanganese, scrap, steel bars, iron rails, steel billets, hoops, wire rods, steel plates and sheets, cut nails and tacks showed a decrease, but on the other hand a heavy increase took place in steel rails, wire and wire nails, while moderate gains are shown in bar iron, iron plates and sheets, structural iron and steel and even in tin plates. If it was possible

to get the tonnage represented by the articles for which the statistics record values only, it is likely that the quantity of iron and steel exported in the fiscal year 1900 would not fall much, if any, below that given for the fiscal year 1899, as the great increase in the value of the exports could not have resulted solely from advanced prices. The exports of iron and steel manufactures for which values only are reported were as follows during the past three fiscal years:

Exports of Iron and Steel, Values only Reported.

Commodities.	1898.	1899.	1900.
Car wheels.....	\$129,446	\$132,124	\$166,829
Castings, miscellaneous.....	804,975	1,055,525	1,573,724
Cutlery, table.....	31,151	31,437	90,500
Other cutlery.....	125,377	164,603	205,712
Firearms.....	672,223	681,440	1,403,915
Builders' hardware.....	3,997,796	4,898,752	5,014,489
Saws.....	206,799	223,764	267,038
Other tools.....	2,223,737	2,719,856	3,464,490
Cash registers.....	Not separated.		813,077
Electrical machinery.....	2,052,564	2,736,110	4,328,917
Laundry machinery.....	Not separated.		441,562
Metal working machinery.....	4,618,683	6,491,586	7,193,390
Printing presses.....	874,515	847,006	1,219,774
Pumps and pump/g machinery.....	2,023,034	2,710,654	3,108,279
Sewing machines.....	3,136,364	3,264,344	4,540,842
Shoe machinery.....	895,788	853,936	1,163,265
Fire engines.....	7,497	13,973	14,915
Locomotives.....	3,883,719	4,728,748	5,592,403
Stationary engines.....	398,570	335,061	652,976
Engine parts and boilers.....	927,552	1,132,489	1,756,199
Typewriting machines.....	1,902,153	2,449,205	2,697,544
All other machinery.....	13,336,930	18,722,251	21,913,202
Pipes and fittings.....	3,092,016	5,875,748	7,024,888
Safts.....	87,614	145,349	149,637
Scales and balances.....	343,200	390,214	535,932
Stoves and ranges.....	382,980	503,739	535,385
All other manufactures of iron and steel.....	9,305,977	10,464,055	15,322,922

It is worthy of remark that every item in the above table, without a single exception, shows an increase in the past year as compared with the preceding year. In some instances the increase has been quite heavy. As these articles are to a great extent highly finished manufactured products, the showing is exceedingly creditable and satisfactory.

Passing to the exports of allied industries, notably the metal trades, we have the following exhibit:

Commodities.	1898.	1899.	1900.
Mowers and reapers.....	\$5,500,665	\$9,053,830	\$11,241,683
Plows and cultivators.....	927,250	1,545,410	2,178,098
All other agricultural implements.....	1,181,817	1,832,957	2,675,105
Railroad cars.....	1,478,188	1,554,012	2,554,907
Street cars.....	260,393	504,484	984,354
Carriages and parts.....	1,685,838	2,047,788	2,800,784
Bicycles and parts.....	6,846,529	5,753,880	3,551,025
Clocks and watches.....	1,727,469	1,863,431	1,974,902
Plated ware.....	417,824	450,462	508,024
Furniture of metal.....	21,758	182,128	289,795
Cartridges.....	1,255,762	1,350,247	1,691,736
Lamps, chandeliers, &c.....	672,010	777,379	977,932
Tin manufactures.....	263,365	365,470	386,721
Nickel, oxide and matte.....	1,402,803	1,110,222	1,219,812
Oxide of zinc.....	211,299	316,862	474,296
Zinc ore.....	313,370	448,145	980,999
Zinc, pigs, bars, plates, sheets and all other manufactures of.....	1,339,668	1,156,970	1,668,202
Copper sulphate.....	475,717	1,173,186	2,120,745
Copper ore.....	824,165	440,575	1,009,288
Copper, ingots, bars, plates and old.....	32,180,872	35,983,529	57,851,707
Copper manufactures.....	1,105,236	1,507,186	2,079,541
Quicksilver.....	414,938	516,459	556,142
Aluminum and manufactures of.....	*	441,846	244,091
Brass and manufactures of.....	1,320,093	1,351,049	1,866,727
Lead and manufactures of.....	223,018	235,112	329,630

*Not separately stated prior to July, 1898.

Specially noteworthy in this table is the heavy increase in the exports of copper. Agricultural implements, railroad cars and carriages make a good showing, but bicycles continue to decline, representing barely half the value of the exports in 1898.

In this connection it is interesting to note the export statistics of a few miscellaneous items having special value to many of our readers, as follows:

Exports of Miscellaneous Articles.

Commodities.	1898.	1899.	1900.
Anthracite coal, tons.....	1,326,582	1,571,581	1,775,168
Bituminous coal, tons.....	2,682,414	3,480,352	5,413,453
Coke, tons.....	212,021	215,513	363,202
Fire brick, value.....	\$127,260	\$175,323	\$400,072
Cordage, value.....	576,140	735,049	927,805
Twine, value.....	1,091,576	1,505,345	2,645,771
India rubber belting, hose and packing, value.....	Not separated.		\$539,013

Our imports of iron and steel increased considerably during the year, whereas for a long series of years pre-

ceding they had shown a continuous decline. The prevalence of excessively high prices, coupled with a temporary shortage in the domestic supply, is the explanation of the increase shown in the imports of a number of articles set forth in the following table:

Imports of Iron and Steel.

Commodities.	1898.	1899.	1900.
Total value, exclusive of ore.....	\$12,626,431	\$12,100,440	\$20,476,524
Iron ore, gross tons.....	352,455	269,013	946,194
Pig iron, gross tons.....	25,640	23,316	61,100
Scrap iron, gross tons.....	1,502	4,642	28,185
Bar iron, gross tons.....	15,177	19,976	21,315
Steel rails, gross tons.....	529	624	2,487
Hoops and bands, gross tons.....	31	10	6,824
Steel ingots, billets, gross tons.....	13,759	10,624	14,251
Sheets, plates and taggers, gross tons.....	2,634	1,895	10,519
Tin plate, gross tons.....	76,635	48,431	66,034
Wire rods, gross tons.....	17,678	15,451	21,033
Wire and wire articles, gross tons.....	2,374	2,357	1,808
Anvils, gross tons.....	348	236	259
Chains, gross tons.....	78	162	285
Cutlery, value.....	\$944,056	\$1,188,916	\$1,534,348
Files and rasps, value.....	35,344	42,760	59,709
Firearms, value.....	409,032	758,575	838,528
Needles, value.....	362,606	407,786	367,587
Machinery, value.....	1,875,222	1,630,542	3,568,973
Shotgun barrels, value.....	48,885	138,871	182,906
All other manufactures of iron, value.....	1,107,596	1,210,827	1,671,694

It may be confidently expected that for the remainder of this year imports will decrease and exports will increase. The heavy reduction in domestic prices of iron and steel has brought our markets more in line with those of the world at large, while our works are no longer so crowded with orders from home consumers that they are indifferent to foreign business.

The Electrical Engineers.

The American Institute of Electrical Engineers will hold a meeting in Europe this summer. A programme of functions at London and Paris has been issued, from which it is learned that members are requested to register at the Institution of Electrical Engineers, 28 Victoria street, Westminster, S. W. By courtesy of the Institution of Electrical Engineers, on Sunday, August 12, a trip will be taken up the Thames by rail to a convenient point, thence by electric launches and returning by the same route after lunch. On the following Monday and Tuesday visits will be arranged to works, &c., in the vicinity of London, a dinner being held in the evening of Monday. On Wednesday a special train will be taken to Paris. On Thursday a joint meeting will be held by the courtesy of Commissioner Peck in the United States Pavilion. The subject for discussion will be "The Relative Advantages of Alternate and Continuous Currents for a General Supply of Electricity, Especially with Regard to Other Interests."

Announcement is made that the Imperial Russian Marine for the fourth time in very recent years placed a contract with the Bethlehem Steel Company for armor plate. The main office of the company at South Bethlehem, Pa., has been advised by its foreign representative that he has closed a contract for 2000 tons of Kruppized armor to be delivered within 15 months. This order for American made armor is for the three new Russian vessels, "Alexander III," "Orobino" and "Orel." The price obtained is stated to be considerably above that for which Bethlehem armor has been offered to our Government.

A Pittsburgh dispatch of July 30 reports that the Carnegie Steel Company have contracted to make 1000 tons of 11-inch armor plate for the Russian Government to recover the "Emperor Alexander III," "Orel" and "Borodino." The plates will be Krupp plates and are to cost \$560 per ton. The Homestead armor plant is busy at present on orders for the United States, Japanese and Russian governments, and these, with the last large order, will insure the full operation of the plant for at least a year and a half.

The examination of the selling sheets of the American Sheet Steel Company by the Wage Committee of the Amalgamated Association was completed in Pittsburgh last week, the reports being for shipment of sheets in May and June. The average prices of shipments for those months was below 3 cents, and as a result there will be no increase in wages of sheet mill hands for July and August.

The Taylor-White Process Tool Steel.

In the reorganization of the shop methods of the Bethlehem Steel Company, F. W. Taylor found that one of the most important changes was the discontinuance of the miscellaneous assortment of tool steels used by the different men in the shop, and the adoption of a standard and uniform grade. A special lathe was set aside for the purpose of experimenting with tool steels of different makes, with a view to the selection of a standard for use, and several picked men were set to work testing the relative merits, not only of the different tool steels then in the shop, but all brands of established reputation. In the elaboration of these tests the services of Maunsel White, engineer of tests of the company, were enlisted. This full and exhaustive investigation led to the discovery which, carefully studied and persistently followed up, has resulted in the remarkable development now seen in their machine shop. In the tests of these various makes of tool steel over 200 tons of steel forgings have been cut up into turnings on the experimental lathe. The outcome of this thorough work has been the discovery of the process known as the "Taylor-White," which has been purchased by the Bethlehem Steel Company.

This process consists in the treatment of the tool after it has been forged, and which imparts to the steel the very valuable and exceptional property of retaining a high degree of hardness when heated to a visible red. It is possible with one of these tools to cut steel at a speed so great as to heat up the point of the tool to redness, and have it continue to cut several minutes at this speed, leaving an unusually smooth finish on the work, as well as cutting accurately to size. The practical speeds at which these tools will run have been found to be from two to four times that of any steels with which the company have experimented.

The process is in no sense one of surface hardening. After the tool has been dressed or machined to shape and the process applied, the penetration is to the center of the steel, even in tools as large as 4 inches square. In other words, the center of the tool is in precisely the same condition as those portions near the surface. While all of the standard brands of self hardening steel which have been experimented with are improved to a greater or less extent by the treatment, it is preferred to use a steel of special composition in order to get the greatest uniformity and maximum results. This special steel forges so much more readily than the general run of self hardening steels that tools of difficult shapes may be easily formed. The thorough penetration effected by the process insures the use of the tool until it becomes so small, by reason of regrinding, that it cannot be held in the machine. This special steel can be annealed so that it can be easily machined to shape, making it applicable to twist drills, chasers, inserted cutters, &c. The tools made in accordance with this method are also extremely uniform in quality, so that the work on which they are used can be regularly performed at the maximum rate of speed.

After these tools were introduced in the machine shops of the Bethlehem Company it was found necessary to overhaul the entire plant both as regards machines and line shafting. While the results have been unprecedented the end has not yet been reached, mainly because of lack of power in the driving mechanism of the different machines. In many cases it is impossible to operate the machines at the speed desired and at the same time take the heavy cut of which the tool is capable. The main lines of shafting have been speeded from 90 to 250 revolutions, and further changes in countershafts have been made to speed up individual machines, this combination being largely responsible for the increased efficiency of the shop. The following table shows the increase in efficiency of each tool per hour in terms of metal removed:

Average.	October 15, 1898.	May 11, 1899.	January 15, 1900.	Gain in per cent. out of third over second.	Gain in per cent. out of third over first.
Cutting speed.....	8 ft. 11 in.	21 ft. 9 in.	25 ft. 3 in.	16	183
Depth of cut.....	0.23 in.	0.278 in.	0.30 in.	4	30
Feed.....	0.07 in.	0.0657 in.	0.087 in.	32	24
Pounds of metal removed per hour	81.18	81.52	137.3	68	340

Last Tuesday the company gave a practical exhibition at their works of the qualities of this special process steel, and showed the work it was capable of doing under every day conditions. An unusually hard and gritty piece of cast iron, about 7 feet long by 8 inches in diameter, was placed in the lathe. A heavy cut was taken on this for 15 minutes with a special process tool. At the end of that time the cutting edge of the tool showed no signs of wear, the only effect being a discoloration in the vicinity of the cutting edge. A tool of the same shape, made of Mushet steel, and taking the same cut at the same speed, lasted only 22 seconds. A steel shaft was then placed in the lathe and run at a cutting speed of 150 feet per minute. The edge of the special tool became visibly red, and yet was uninjured after having been run four minutes. Under the same conditions a Mushet tool fell down completely in six seconds. Exhibitions were also made of the extraordinary properties of this steel in heavy cuts at fast speeds in planer work, on both hard and soft steels, on forgings of different grades of steels, and with chasing tools making armor plate bolts. A 1½-inch twist drill made by the company has been run through 4-inch armor plate at the rate of 250 revolutions per minute, both tool and plate being red hot, and yet the tool receiving no damage. While an ordinary drill went through the plate, it was chewed up in its passage.

A great advantage in the use of these tools is that when cutting dry at the rate of maximum efficiency the chips should come off blue. These blue chips enable the foreman, at a glance, to tell whether the work is being done at the proper speed. When running under water at the correct cutting speed the chips should show blue immediately upon shutting off the water and allowing the tool to cut dry for a little while.

A comprehensive idea of the wide application of this steel, as far as forging is concerned, was obtained in the tool room. Almost every shape was here represented from the plain simple forging to the most intricate. One particular specimen was a hollow drill used for removing test pieces from armor plates. The cutting lips had been machined to shape in the final process.

The company are introducing this method of treating steel by granting shop rights. The purchaser is supplied with all information necessary to carry on the work.

The International Power Company.

Business was never brisker at the Rhode Island Locomotive Works, Providence, R. I., operated by the International Power Company of New Jersey, than it is at present. In several departments the works are running night and day in order to keep pace with the orders. Among the orders recently completed are five consolidation locomotives for the Colorado & Southern Railway, five powerful 10-wheeled locomotives for the Fort Worth & Denver City Railroad, five 10-wheeled passenger locomotives for the Plant system of railways, five consolidation locomotives for the Cincinnati, New Orleans & Texas Pacific Railway, and six 10-wheeled locomotives for the Plant system. There are now under construction six consolidation freight locomotives for the Mexican Central Railway, which will be completed in a few days. Last week an order was received from the Atchison, Topeka & Santa Fé Railway Company for 20 10-wheeled passenger locomotives, to weigh 163,000 pounds. The locomotives constructed at these works are of the very latest and most approved type, and are winning recognition all over the world. The Corliss Engine Works, operated by the same company, are also running steadily with a full force of hands, and numerous orders are on hand from American and European concerns.

The Amalgamated Association of Pittsburgh have sent out official notices to the lodges of the advance in puddling from \$6 to \$6.12½ and a 2 per cent. advance in finishing wages. The notice reads as follows: "The 60 day examinations with the Republic Iron & Steel Company show the card rate to be 1.8c. for the 60 days beginning with July 1, 1900; consequently the price for puddling is now \$6.12½ per ton. The other departments covered by this card are also to receive the prices opposite the 1.8c. in their scales. This applies to all the scales up to and including 12-inch and bar mills. On guide, 10-inch, hoop and cotton tie mills there is an advance of 6 per cent. above the base prices of the new scale book. This applies to all tonnage jobs and also to all helpers who are members of the Amalgamated Association. The base figures now in the book for guide, 10-inch, hoop and cotton tie mills must be increased 10 per cent., after which the 6 per cent. is to be added. This is made necessary and explained by the last line in the preamble of guide mill scale. The examination of the selling price of the American Tin Plate Company shows that our men now at work in mills where the scale is signed are entitled to an advance of 12 per cent. over the prices of the scale book. The advance applies to all helpers as well as all tonnage men."

A press dispatch from Huntington, W. Va., states that 1000 miners in the Davy coal fields have been granted a 10 per cent. increase in wages. The mines throughout the State are running at their fullest capacity and are unable to keep up with orders.

Central Pennsylvania News.

HARRISBURG, July 30, 1900.—With the coming of August the iron and steel interests in this section look for better things. There are already favorable indications, and many manufacturers are disposed to look ahead with a feeling of confidence. There is not that gloomy apprehension which might be imagined existed here and throughout the district from the reports of daily newspapers. Many of the statements are made without proper knowledge of the facts, and a wrong impression of the situation goes out in this way. A few of the larger plants are not running to their full capacity, but there are few idle mills. A number of the furnaces have been banked and there is talk of others going out of blast, but this is but a natural sequence of overproduction following largely increased capacity and a falling demand. The sinking market has undoubtedly had the effect of checking many large enterprises, and there are several large plants in Central Pennsylvania which are waiting specifications for work which was ordered weeks ago, but which has been suspended pending a settlement of the price question. When the adjustment shall have been perfected there is sufficient business in sight to insure good times for months to come. Fortunately the workmen are quite well satisfied that the dullness has come about in the summer period, when they would as soon take a holiday as work. The total production of the plants in this immediate vicinity has been large, in view of the intense heat of the past month.

The Pennsylvania Steel Company evidently feel satisfied with the outlook. President Felton is not a rainbow chaser, and when he says that the company are now enjoying the most prosperous period in their history he is not talking for effect. During many of the months of the great revival last year the business of the larger concerns was affected to some extent by conditions over which they had no control; but this year there has been an improvement in certain directions, and the margins are not so narrow on large contracts. Heavy shipments are being made by the Pennsylvania Company and new orders are constantly being booked. During the past week there was shipped to Oriskany, N. Y., for the New York Central & Hudson River Railroad Company, an immense girder weighing 144,000 pounds, 87 feet long and 8 feet wide. It is probably one of the largest girders ever made in this country. Three flat or gun cars were necessary to transport it. This was the last of three massive girders for this railroad, the other two weighing 126,000 and 122,000 respectively. There were in addition a number of smaller girders weighing 75,000 to 80,000 pounds. Several of the girders were longer than the large one sent out Friday. The company have been making heavy shipments of structural material, and the first lot of rails in a 9000-ton order for the Interior Construction & Improvement Company of New York has gone forward to Bolivar, N. Y. These shipments of rails will be made as rapidly as possible, for the company are desirous of completing their work in different parts of the State before cold weather. Many of the departments of the works are pushed to their full capacity, and the general volume of business for the past week has been up to the average. There has been no falling off in orders for the bridge and construction and frog, switch and signal departments, and work is being pushed on the various new departments. The track improvements in the yards have proven satisfactory in facilitating the movement of freight and shipments. Forty-two new names were added to the rolls during the week. Wherever possible the employees will be given a Saturday holiday.

The Lackawanna Iron & Steel Company are having all their machinery overhauled at the Lebanon plants, and trainload after trainload of lake ore is being received.

The Harrisburg rolling mills are in operation, and the outlook for a steady run is fairly good.

The large universal mill of the Central Iron & Steel Company is running right along, and other portions of the works are in steady operation.

Large shipments to the Woodhaven plant have been made from the tin mills of the Lalance-Grosjean Company here. A large order placed by a Philadelphia company assures continuous operation of the plant months ahead.

There is no falling off at the Harrisburg Foundry & Machine Works. Orders are coming right along, and the works are running steadily on engines for large concerns in all parts of the country.

The Raymond Mfg. Company, at Middletown, recently reorganized, will manufacture stoves and a large number of other products. Alexander Balfour of Philadelphia is the president of the company, and the new concern will give employment to many hands.

There are signs of revival at the National Tube

Works, at Middletown. While there has been no shut down, the plant has not been in full operation, and many of the employees have sought employment elsewhere. Last week another of the furnaces was put in blast and to-day still another started. The company have had considerable difficulty in getting rid of their refuse by reason of litigation with former Congressman John Rife, who has had the company enjoined from using a stream which passes over his land. He also threatens to interfere in the courts with another plan which the company have adopted for getting rid of the refuse.

The annual meeting of the Harrisburg Boiler & Mfg. Company was held last week. All the reports were encouraging. There was no change in the directors of the company, who have an abundance of orders.

The Lucknow Forge is running double turn on metal blooms and scrap blooms.

The Harrisburg Pipe & Pipe Bending Company report plenty of inquiries and good business. S. F.

OBITUARY.

JAMES C. FOSTER.

James C. Foster, chemist at the Tennessee Coal, Iron & Railroad Company's furnaces at Sheffield, Ala., died on July 17 from accidental poisoning, caused by drinking water out of a bottle that had contained corrosive sublimate. Mr. Foster was a native of Pennsylvania and had filled the position of chemist at the Sheffield furnaces for about four years.

FRANKLIN PRATT.

Franklin Pratt, a widely known geologist of Philadelphia, died on July 24 at Cape May, N. J., in his fifty-sixth year. He was born in Philadelphia and passed through the University of Pennsylvania. During the Civil War he served in the Thirty-second Regiment Pennsylvania Volunteers. In 1864 Mr. Pratt was appointed to the United States Coast Survey and during that year was assigned to work with the North Atlantic Squadron. He was afterward appointed to the staff of Gen. Orlando M. Poe, Chief Engineer of the Military Division of the Mississippi. In 1874 Mr. Pratt was appointed Assistant Geologist of Pennsylvania and held that position until May, 1881, when he resigned to become president of the Rochester & Pittsburgh Coal & Iron Company. He also was manager of the Adrian Beech Tree Mines of Pennsylvania. Mr. Pratt was a frequent contributor to the transactions of the many scientific societies of which he was a member. He prepared nine volumes of the "Report of the Geological Survey of Pennsylvania."

JAMES H. THOMPSON.

James Halliday Thompson, one of the most prominent iron men of Youngstown, Ohio, died on July 22, at his home in that city, aged 55 years. He was born at Chatham, England, and came to this country with his parents when a child. After serving with credit in the army during the Civil War, Mr. Thompson secured employment in various rolling mills, subsequently entering the service of Fowler & Matheson, hardware dealers, of Youngstown. Ultimately he became part owner of the business. At the time of his death he was secretary, treasurer and general manager of the Stambaugh-Thompson Company, and a director of the Youngstown Bridge Company and of the Youngstown Carriage & Wagon Company. A widow and three children survive him.

ROSWELL H. ST. JOHN.

Roswell H. St. John, a well-known Cleveland inventor, died at his home very suddenly on July 27. Mr. St. John was for a number of years identified with the sewing machine business as an inventor and manufacturer. In 1890 he became interested in what is now known as the St. John method of making or producing type bars. Prior to this the only successful method of producing such bars was by the Mergenthaler machine, in which the type bar or linotype is produced by a process of casting. Mr. St. John conceived the idea of making a type bar by what he has always referred to as a cold process, in which no heat is required, the bar being produced by pressing a solid body and a strip of flowing type metal together against assembled matrices. This forces the strip on a tongue on the body of the bar, and at the same time imprints the assembled characters on the strip. For the past ten years Mr. St. John has been engaged in developing this process, but he was taken away before he could reap the benefits of his invention and before the best efforts of his life were fully realized. Very recently the St. John Typo Bar Company of New York were incorporated with a capital of several millions, and the work of erecting a large plant has been started under Mr. St. John's supervision.

PERSONAL.

At the recent commencement of Washington and Jefferson College, at Washington, Pa., the oldest institution of learning west of the Allegheny Mountains, the honorary degree of Ph.D. was unanimously conferred by the trustees upon James M. Swank, the general manager of the American Iron and Steel Association. Mr. Swank was a student at Jefferson College 50 years ago, before its union with Washington College.

Thomas Morrison, superintendent of the Edgar Thomson plant of the Carnegie Steel Company, has gone for a tour in Europe, to be absent until October.

George Claypool, formerly manager of the Andrews Works of the Republic Iron & Steel Company, at Youngstown, has been transferred to the district sales offices in Cleveland. Mr. Claypool succeeds Harry Jackson as traveling salesman in the Cleveland district.

Geo. H. Ismon has been appointed Pacific Coast sales agent for the American Steel & Wire Company, to succeed Frank L. Brown, resigned. The appointment was effective August 1.

Wm. S. Roberts, for the past three years superintendent of the Greenville Works of the American Steel Hoop Company, at Greenville, Pa., has been appointed assistant general manager in Pittsburgh. T. R. Smith succeeds him at Greenville.

C. Kirchhoff, editor of *The Iron Age*, has returned from Europe.

Jones Wister of L. & R. Wister & Co., Philadelphia, has returned from a trip abroad, during which he visited Egypt, the Holy Land, Turkey, France and England.

Among the passengers on the "Kaiser Wilhelm der Grosse" just arrived was Robert M. Thompson, president of the Orford Copper Company, New York, who enjoyed a yachting excursion along the coast of Norway and into the Arctic Sea.

The John Scott Premium Legacy and Medal has been awarded by the Franklin Institute to Edwin R. Fellows of Springfield, Vt., for his machine and cutter for generating gear teeth.

Typewriting by Telegraph.

Telegraphy by the use of typewriters in place of the ordinary clicking keys and receivers familiar in telegraph offices has been made possible, says the *Chicago Times-Herald*, by two Chicago men, Zalmon G. Scholes and Alfred C. Gilmore. They have devised a mechanism by which a message written with ordinary spelling on a machine that has a keyboard exactly like the keyboard of the ordinary typewriter will be printed if transmitted over a telegraph wire by another typewriter in the office to which it is sent, hundreds of miles away. The instruments have been tested over a circuit of 265 miles of wire, belonging to the Central Union Telephone Company, connecting Bloomington, Springfield and Peoria. The feature of the invention is that while it receives and delivers messages in the ordinary alphabet spelling, it transmits them by the use of the Morse telegraphic alphabet of dots and dashes. The transmitter turns each letter, figure or punctuation point into dots and dashes, and the receiver, which contains an instrument called a "selector," turns the dots and dashes back into the ordinary signs.

The Pelton Engineering Company, Cleveland, Ohio, manufacturers of all kinds of electrical machinery, have added another department and are now engaged in buying and selling all kinds of second-hand machinery and tools. This department is in charge of W. H. Bosworth.

The sixty-ninth meeting of the New England Cotton Manufacturers' Association will be held at Washington on October 17 and 18. While the arrangements are not fully completed, yet it is promised to be a meeting of unusual interest, while it is a favorable time to see the numerous attractions.

At Cleveland, Ohio, on Saturday, July 28, the new steel vessel "Princeton," built for the Pittsburgh Steamship Company, a Carnegie Steel Company interest, was launched. The vessel will be used for hauling ore from the ore regions to lower lake ports.

We are officially advised that the report that the American Tin Plate Company would remove their Star Works, in Pittsburgh, to some other location is untrue. The removal of this plant at this time is not contemplated.

Connellsville Coke Statistics.

The Connellsville (Pa.) *Courier* for July 14 publishes a statistical statement relative to coke production in the Connellsville region, from which we take the following interesting information:

The total output of the region for the first six months of the year aggregates 5,746,252 tons and indicates an output for the year, at the present rate of production, of about 11,000,000 tons, or nearly 1,000,000 tons more than that of 1899. It is probable that the output will be greater. The following table shows the shipments by months in tons of 2000 pounds for the first half of 1900 as compared with those of the two previous years:

Months.	1898.	1899.	1900.
January.....	727,739	779,792	1,001,882
February.....	667,287	699,474	910,729
March.....	744,967	839,763	1,044,588
April.....	701,817	831,964	982,551
May.....	680,754	804,023	994,186
June.....	696,877	837,123	872,316
Totals.....	4,158,961	4,792,139	5,746,252

The following table shows the monthly shipments by cars to the three general sections of distribution, with the totals for the month and the average shipment for each working day in the month:

Months.	Pittsburgh.	West.	East.	Total.	Daily average.
January.....	15,366	26,271	9,302	50,939	1,867
February.....	14,519	24,763	8,607	47,889	1,995
March.....	15,614	28,010	8,869	52,493	1,944
April.....	12,917	27,128	9,693	49,738	1,900
May.....	12,338	24,066	10,006	46,410	1,720
June.....	12,462	21,935	8,574	42,971	1,653
Totals.....	83,216	152,173	55,051	290,440	1,865

It will be seen by the above figures that the maximum of monthly production or shipments was attained in March of this year with January a close second. Since March a steady decline has taken place from month to month. Taking the daily average of cars shipped, however, the maximum appears to have been reached in February, although for the three months, February to April, the daily average was very nearly the same. Notwithstanding the recent falling off in shipments, the *Courier* believes that the hitherto unprecedented record of 1899 will be easily outstripped this year.

Tool Trust in Germany.—Consul-General Guenther writes to the State Department as follows from Frankfurt, June 12, 1900: "The manufacturers of first-class tools and of iron and steel goods in Westphalia and the Rhenish Province have formed a trust. Its avowed purpose is to fight foreign competition in tools, &c., and the menacing commercial invasion from the United States. At the same time it is intended to combat the domestic production and sale of shoddy goods at ruinous prices. Every competent manufacturer who obligates himself to sell only first-class goods and mark them with the firm's name and price can become a member of the union. The sale of poor and defective articles will result in expulsion. A committee will supervise the quality of the goods. The sale will be regulated by the union as much as possible, especially as to prices, terms, &c. For effective opposition against foreign competition united action will be inaugurated."

The Pittsburgh Coal Company, organized last year at Pittsburgh and who took over many valuable coal properties, have by far the most extensive private equipment of coal cars of any similar concern in the country. The number of these cars reach close to 4000, and their carrying capacity ranges from 30,000 to 70,000 pounds. Most of this equipment came to the company from the constituent interests. This extensive private equipment is in charge of H. J. Lawrence, traffic manager; Charles Porter, superintendent of transportation; J. L. O'Toole, car accountant; J. E. Simons, superintendent of rolling stock and machinery. Mileage reports on this equipment are received by C. W. Baine, secretary and auditor of the company, and remittances by U. A. Andrews, treasurer.

The National Fire Proofing Company of Pittsburgh have received a contract for all the fire proofing for the new Union Depot in Pittsburgh, now under erection. The National Fire Proofing Company have factories located in Pittsburgh; Port Murray, N. J.; East Palestine, Ohio, and Revere, Mass. The president of the company is D. F. Henry, the secretary is W. D. Henry and Congressman W. H. Graham is the treasurer. The company have done the fire proofing in many of the biggest buildings in Pittsburgh, and have also similarly fitted out some of the largest buildings in New York, Philadelphia and other cities.

Trade Publications.

Washington Tool Company's Specialties.—The Washington Tool Company, Owatonna, Minn., have issued an illustrated circular calling attention to their specialties. They manufacture the Larson combination pincers in various sizes, running from 6 to 14 inches in length, which are adapted to the many varieties of uses for this class of tool; also alligator wrenches, running from 6 to 10 inches in length. All their products are made of high grade steel.

Hand Elevators.—The Franklin Machine Works, St. Paul, Minn., are issuing illustrated circulars descriptive of their Lion hand elevators, having a lifting capacity of 1500 to 2000 pounds. These elevators are fitted with the Archimedes spiral brake, which is self adjusting as to wear. The gear wheels have teeth of the involute type, formed by an automatic gear cutting machine, and are absolutely true and smooth working. Anti-friction steel roller bearings are provided for the shafts. All other parts are carefully made and guaranteed against defects.

Wood Working Machinery.—The Egan Company, department of J. A. Fay & Egan Company of 179 to 199 West Front street, Cincinnati, Ohio, the largest manufacturers of wood working machinery in the world, have just issued a large illustrated hanger, showing nearly 100 of the different machines they make, and among which will be found some of the very latest improvements in this line. The Egan Company will forward one of these hangers to any of our readers who may be interested and will write for it.

Pump Governors and Receivers.—The Creamer Perfection Steam Specialties Company of Bayonne, N. J., have prepared a catalogue describing their Perfection pump governors and receivers, which when used in connection with duplex or other steam pumps will positively return all condensation from the steam heating systems direct to the boilers and also control the speed of the pump so that perfectly dry returns are guaranteed. The Perfection balanced steam traps are used for automatically draining and returning the condensation from steam pipes, cylinders, &c. These traps may be used for either high or low pressure. Their high pressure boiler feeder and pump governor is used for controlling the pump supply feed water to boilers either from the water main supply or otherwise, which pressure will be sufficient to feed the boilers against high pressure steam, at the same time preventing the boilers from overfeeding.

Grinding Machines.—A catalogue considering grinding machines for plane surfaces and segments of cylindrical surfaces has just been received from the George Gorton Machine Company of Racine, Wis. The introduction states that grinders for finishing circular work, such as spindles and arbors, are indispensable in the modern shop through their capacity for producing the most perfect work in the most economical manner. What such grinders are to circular work their grinders are to flat work. Their employment means a piece finished rapidly and with all the desired accuracy thrown in. The machines are built both plain and universal, the former being in two types—namely, English standard, which has double feeds registered in thousandths of an inch, and the metric standard, which has double feeds registered in hundredths of a millimeter. These grinders are made of the best materials obtainable for the purpose intended. The arbors are of crucible cast steel, finished accurately by grinding, mounted in bearings adjustable for wear and to take up end motion. All other round work is finished accurately by grinding. All parts are made in large lots to standard gauges and are therefore interchangeable. Oiling and the exclusion of grit from the working surfaces have been carefully provided for in what has proved a most highly satisfactory manner. Their disk grinders are equipped with steel disks accurately finished and to which emery cloth or paper or carborundum cloth or paper is cemented by means of the press furnished. This provides a true cutting surface from which accurate work must result.

Machine Tools.—An attractive catalogue has been published by Beaman & Smith of Providence, R. I., concerning the machine tools built by them, which include single and multiple spindle vertical milling machines, horizontal spindle milling machines, boring and drilling machines made in standard and special types, engine frame and cylinder boring and facing machines, &c. Their four-spindle milling machine has two horizontal and two vertical spindles, each provided with independ-

ent adjustment and driven from one source of power. Their No. 1 duplex milling machine has two spindles in line with each other, carried by sliding heads, one fixed, the other provided with screw adjustment. The spindles have threaded ends for end milling cutters, also taper holes for cutter shanks and arbors, with retaining bolts through their centers. All are driven independently. Their No. 2 horizontal spindle milling machine has one spindle placed horizontally in a head in front of an upright on which it is provided with vertical adjustment, and with it any kind of cutter can be used.

Ice Making and Refrigerating Machinery.—The York Mfg. Company, York, Pa., have issued a neat little pamphlet giving a list of some of the parties using their latest improved ice making and refrigerating machinery. Although the names given are of parties erecting plants between January 1, 1898, and June 1, 1900, the list is sufficiently large to cover several pages.

Electric Trucks.—The McGuire Mfg. Company, 122 North Sangamon street, Chicago, are distributing a wall calendar for the last half of the year, to which are attached 10 large half tone illustrations of the class of work turned out by them for electric cars.

MANUFACTURING.

Iron and Steel.

The Cumberland Steel & Tin Plate Company, Cumberland, Md., state that all of their plant, with the exception of the tin plate mill leased to the N. & G. Taylor Company, will shortly become a part of the newly organized Crucible Steel Company, and that business for the present will be continued at Cumberland under their management. The Cumberland Steel & Tin Plate Company expect to amend their charter to the extent of having their name changed and will continue to own the tin plate plant, but will not operate it; they therefore will not go out of existence as a corporate body.

The Diamond State Steel Company, Wilmington, Del., advise us that their new steel plant is about completed, and they expect to start some of their open hearth furnaces at once and to be producing steel within a week. Under the recent conditions of the market they have not hurried the completion of the plant as rapidly as they might, otherwise they would have been in operation a month or so ago. They have, however, secured some business for the plant and are now going ahead as rapidly as possible. The company are manufacturers of splice bars, track bolts, railroad spikes, machine bolts and nuts, boiler and bridge rivets, merchant bars, horseshoe iron and horse and mule shoes.

The Buffalo Steel Company have completed their new rolling mill at Tonawanda, N. Y., and expect to commence operations this week. Their production will be Bessemer steel bars, angles, channels, tees, special shapes used in the manufacture of agricultural implements, tires and sleigh shoes, and bedstead angles. The company are very closely allied to the Inland Steel Company of Chicago, the directors and officers practically being the same in both companies. The list of the officers is as follows: President, L. E. Block; first vice-president, P. D. Block; second vice-president, G. H. Jones; treasurer, J. G. Joseph; secretary, J. H. Porter.

The preliminaries for the erection of the Seaboard Steel Works, at Chester, Pa., are now well under way. The iron work is arriving and being unloaded. The furnaces will be started soon, the foundations being nearly completed.

The Solid Steel Casting Company, Chester, Pa., have just shipped one of the largest steel castings ever made in that section. Another company had the contract for the casting, but owing to its peculiar shape and measurement it could not be transported over the railroads in the vicinity of their works, as the bridges would interfere with it in transit. The Solid Steel Casting Company are very busy filling large contracts for car wheels and engine frames.

The plant of the Burgess Steel & Iron Works, at Portsmouth, Ohio, taken over by the Crucible Steel Company of America, has been closed down for a little while owing to the refusal of the firm to sign the Amalgamated scale. The trouble has been partly adjusted and the plant is expected to be in full operation this week. The settlement will be made under the terms of the company and the Amalgamated scale will not be signed, nor will that organization be recognized. This plant has been operated non-union heretofore and this policy will be pursued.

The report that the Lackawanna Iron & Steel Company have ordered 1000 self clearing twin hopper cars of 80,000 pounds capacity for September delivery is untrue. The company have not ordered a car.

Brown & Co., Incorporated, operating the Wayne Iron & Steel Works, at Pittsburgh, have signed the Amalgamated Association scale.

General Manager Campbell of the Republic Iron & Steel Company, at Youngstown, Ohio, denies the report that the company's Haselton mill is to be abandoned. He states the mill is

to be placed in operation again as soon as the demand for iron justifies.

The Alabama Rolling Mill Company of Birmingham, Ala., have signed the Amalgamated Association scale.

Machinery.

Beaman & Smith, Providence, R. I., manufacturers of drilling and boring machines, are adding to their plant an addition 125 x 60 feet, with a gallery on one side. The addition, which will be used principally as an erecting department, corresponds with the main part of the original building and is of steel and brick, with provision for plenty of light.

The Mead Gas Engine Company, manufacturers of stationary and marine, gas and gasoline engines and gasoline launches, Providence, R. I., are obliged to run overtime with an extra force of hands to keep pace with rapidly accumulating orders. The company were incorporated under a charter this spring with an authorized capital of \$50,000, and commenced active business a few months ago. The outlook for this enterprise becoming an important industry is exceedingly bright.

The Board of Aldermen of Central Falls, R. I., have decided that the smoke from the Electrical Supply Mfg. Company's plant in that city is a nuisance, and in consequence the company have discontinued business there and will move out of the State.

The Pennsylvania Steel Company, Steelton, Pa., have given an order to the Welmer Machine Works Company of Lebanon, Pa., to place two Welmer Improved blowing cylinders on the engines at their blast furnaces. The Claire Furnace Company of Sharpsville, Pa., have given an order to the same company to place a blowing cylinder on their present engine. The Welmer Company report a big demand for their blowing engines and blowing cylinders to be placed on old engines, and state that their works are working overtime in all departments.

The Buckeye Engine Company of Salem, Ohio, have contracted for an extensive addition to their plant. This sets at rest the rumors that the company are contemplating the removal of their plant to another location.

W. M. Mulford, T. M. Sears, Richard Cole, W. F. Deming, Joseph Kell and J. R. Carey of Salem, Ohio, and Christian Dels and John A. Hostetler of Canal Dover, held a conference at Alliance a few days ago to make plans for the organization of a \$250,000 company for the manufacture of a new riveting machine and other forms of machinery at Alliance.

Hardware.

Seascholl & Schroeder is the name of a company located at St. Mary's, Ohio, recently organized for the purpose of manufacturing washing machines of an improved type. They report advance orders for their product as being very satisfactory. They are operating their plant ten hours per day.

The Ideal Cooker Company, Toledo, Ohio, are having an excellent demand for their product and report considerable increase in their foreign trade. One of the more important shipments recently made by them was a lot of 1000 cookers to South Africa.

The Hickman Handle Company, Hickman, Ky., have recently enlarged their productive capacity, the demand for handles being exceptionally good and the outlook promising. The foreign demand, it is stated, is greater than the supply of export stock. New machinery has been added and the company's buildings have been enlarged to provide for the increased demand. A line of curtain poles and window shade sticks will be included in their output hereafter, for the production of which special machinery has been installed.

The L. S. Starrett Company, Athol, Mass., advise us that so far this year they have been favored with by far the largest business they have ever had, and even during the hot summer months, when trade is expected to fall off somewhat, it has kept up remarkably well. Beginning August 1, they are obliged to shut down for two weeks to make certain alterations and improvements which are absolutely necessary. During this time, however, all orders will be promptly filled.

The Ideal Mfg. Company of New Haven, Conn., advise us that they have lately increased their manufacturing capacity by adding more space and additional machinery. They advise the trade and their customers in general that they now hope to be able to fill orders for their full line of reloading tools more promptly than heretofore. They expect to put on the market this fall other new implements of value to shooters that are up to the times, and indications point to a good fall trade, which they will be ready to meet.

Keystone Handle Company, Madison, Ga., are manufacturing hammer, hatchet, sledge, pick, fork, rake, shovel, spade and hoe handles. They are also making broom handles, club spokes, hub blocks and persimmon and maple last blocks.

Charles H. Besly & Co., 10 and 12 North Canal street, Chicago, Ill., report that their general business is still very good. They are receiving many orders for Helmet oil and are now making shipments to Colorado, Dakota, Montana, California and other Western points. They have just received orders for two complete shop equipments to go to India, including lathes, chucks, drills, screw plates, Gardner die stocks, Helmet oil, &c. They are receiving many orders for their Gardner grinders and have recently made shipments to Ohio, Pennsylvania, New Jer-

sey and New York. Aside from the orders they are receiving for their own specialties they note a good demand for general machinists' supplies.

The Universal Bolt & Nut Company of Cleveland were incorporated, with a capital stock of \$50,000, last week. The directors are Dr. John N. McIntosh, John C. Jorden, E. W. Rader and Harry Randolph. Youngstown and Pittsburgh capitalists are said to be interested. The company are looking for a location in Cleveland and will manufacture bolts and nuts.

Miscellaneous.

The Structural Iron & Steel Company of Baltimore, Md., have increased their capital stock to the extent of \$100,000 by issuing 6 per cent. preferred stock. The total capital is now \$200,000, all subscribed for and paid in. The company have recently secured some contracts for structural steel for buildings and bridges, in addition to the Government contract for steel work at the Annapolis Naval Academy. The working force will be increased and the enlarged capital is necessary for the extension of the plant.

W. H. Haws of Johnstown, Pa., has sold his interest in the W. H. Haws Fire Brick Company, at Mount Union, Pa. Henry Y. Haws has secured an interest in the company and will be made general manager.

Charles E. Angell, Providence, R. I., who has heretofore manufactured belt hooks, has disposed of that line of business to the Angell Belt Hook Company, and will in the future devote his time and capital to general machinery and jobbing.

The New Industry Committee of Chester, Pa., has organized by electing Hubert J. Riley chairman and Dr. S. R. Crothers secretary. Within the past few weeks the chairman has received a number of communications from persons in search of sites for manufacturing establishments and of unoccupied buildings that could be used for that purpose. As soon as arrangements can be made those who are desirous of locating in Chester will be invited to the city and shown the most desirable sites.

The County Commissioners of Stark and Columbiana counties, Ohio, will advertise for bids next week for a steel water tower 70 feet high, with a capacity of 1200 barrels of water, to be erected at the Fairmount Children's Home at Alliance, Ohio.

The residents of Prairie Depot, Ohio, have voted to erect a water works plant at a cost of \$15,000.

The power house of the Northern Ohio Traction Company at Akron, Ohio, was damaged by fire to the extent of over \$30,000 last Sunday. The engines and boilers were badly burned, while the electrical equipment was injured by water and heat. The plant has just been placed in operation.

Plans have been completed for the reorganization of the McNeil Boiler Company of Akron, Ohio, now in the hands of a receiver. A few of the old stockholders will be identified with the new company, but the majority of capital is being furnished by Cleveland and Youngstown parties.

The Pennsylvania Railroad Company are reported to be making plans for the erection of a new bridge across the Ohio River near Steubenville, Ohio.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, recently made heavy shipments of their Buckeye metal trough bridge flooring to Montreal, Quebec, to be used in the construction of two large steel bridges being erected by the Dominion Bridge Company.

The Massillon Bridge Company, Massillon, Ohio, last week made shipment of a large section of a cantilever bridge to be erected at White Pass, Alaska, in the construction of a railway to the Klondike. The bridge will be 400 feet long.

The Herring-Hall-Marvin Company have been given a contract by the Pennsylvania Railroad to furnish the steel vaults that are to go in the new Union Station at Pittsburgh.

The steamer "Princeton" of the Pittsburgh Steamship Company, owned by the Carnegie Steel Company, was launched at Lorain, Ohio, Saturday, July 28.

The LaBelle Iron Works, at Wheeling, W. Va., manufacturers of skelp, plates and cut nails, and the Lockhart Iron & Steel Company, at McKee's Rocks, Pittsburgh, manufacturers of bars, signed the Amalgamated Association scale last week.

The first steel ever exported from the South has just been forwarded by the Tennessee Coal, Iron & Railroad Company from their Ensley steel mill to Copenhagen and Glasgow. The shipment to the former city was 25 tons of billets, and to the latter 30 tons of ingots. Vice-President James Bowron of the Tennessee Company is now in Europe, and received orders for these trial shipments.

The Iron and Metal Trades.

The failure of the Chicago conference of Steel and Bessemer Pig Iron interests to agree upon a remedy for existing unsatisfactory conditions can hardly be said to be a serious disappointment, because few had expected that an agreement of any kind could be reached that would be satisfactory to all interests. Nevertheless a considerable part of the trade has chosen to feel disappointed, and therefore the lack of practical results has to some extent caused a feeling of discouragement. The scheme to restrict Pig Iron production has not entirely been abandoned, but some effort is still being made along this line. Whether the restriction is made by agreement among the producers, or from natural causes, it is inevitable that the production of Pig Iron must and will be cut down.

Much more important than the Chicago conference has been the great increase in business during the past week. The Western buying movement in Merchant Bars, which had set in during the previous week, continued in even greater force, and it is estimated that not less than 200,000 tons have been placed under contract in these two weeks by large Western consumers. Our Chicago advices state that some heavy inquiries are still in the market which are not yet closed. The buying has been eager and includes all sorts of consumers. The car builders have been very large buyers, as well as the manufacturers of agricultural implements.

Contracts were taken at extremely low prices, it being claimed that 90c. Pittsburgh was made in exceptional cases for very desirable tonnage. Some of the large Steel manufacturers who were anxious for tonnage have now supplied themselves with work to such an extent that they have advanced their prices.

Business has improved perceptibly in other branches of the Iron trade. Much more has been done in Plates, Structural Shapes, Sheets and even in Pig Iron. The prices of finished products have declined relatively much more than on Pig Iron, and it is believed that for the present the bottom prices in some lines have been reached. The situation as to Pig Iron indicates that not much lower, if any lower, prices are to be expected, as the greatly increased cost of production this year presents an obstacle which is difficult to overcome. Blast furnaces will be blown out rather than be continued in operation at a loss. This fact is appreciated by large consumers of Foundry Pig Iron, who are offering to contract for their supply for the first six months of next year at practically present prices, but furnace companies are not willing to accept such business.

The outlook, while distinctly more favorable to manufacturers, so far as the volume of business is concerned, is not so encouraging when prices are considered. The range of values now prevailing leaves little or no profit on the new business being booked.

Among the sales for export reported during the past week was one of 7000 tons of standard section Steel Rails, made by a Western mill, presumably for Mexico.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Aug. 1, 1900.	July 25, 1900.	July 5, 1900.	Aug. 2, 1899.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	\$16.25	\$16.25	\$17.00	\$20.25
Foundry Pig, No. 2, Southern, Cincinnati	15.50	16.00	17.75	18.00
Foundry Pig, No. 2, Local, Chicago	16.50	17.50	19.00	20.00
Bessemer Pig, Pittsburgh	16.00	16.00	18.00	21.25
Gray Forge, Pittsburgh	15.00	15.00	16.50	17.75
Lake Superior Charcoal, Chicago	21.00	21.00	22.00	22.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	19.00	19.00	25.00	34.00
Steel Billets, Philadelphia	20.50	22.50	27.50	36.00
Steel Billets, Chicago	20.00			
Wire Rods, Pittsburgh	35.00	35.00	35.00	43.00
Steel Rails, Heavy, Eastern Mill	35.00	35.00	35.00	30.00
Spikes, Tidewater	2.10	2.10	2.15	2.00
Splice Bars, Tidewater	2.00	2.00	2.00	1.90
OLD MATERIAL:				
O. Steel Rails, Chicago	9.50	9.50	11.00	15.50
O. Steel Rails, Philadelphia	12.00	13.00	nom	17.00
O. Iron Rails, Chicago	12.50	12.50	14.00	19.00
O. Iron Rails, Philadelphia	14.00	15.00	nom	21.00
O. Car Wheels, Chicago	16.00	14.00	18.00	15.50
O. Car Wheels, Philadelphia	17.00	17.00	nom	17.00
Heavy Steel Scrap, Chicago	9.00	9.00	10.00	13.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.25	1.30	1.50	2.00
Common Iron Bars, Youngstown	1.25	1.30	1.40	1.85
Steel Bars, Tidewater	1.20	1.30	1.50	2.20
Steel Bars, Pittsburgh	1.10	1.10	1.25	2.00
Tank Plates, Tidewater	1.30	1.30	1.45	2.70
Tank Plates, Pittsburgh	1.10	1.10	1.25	2.50
Beams, Tidewater	2.05	2.05	2.05	2.15
Beams, Pittsburgh	1.90	1.90	1.90	2.00
Angles, Tidewater	1.95	1.95	1.95	2.15
Angles, Pittsburgh	1.80	1.80	1.80	2.00
Skelp, Grooved Iron, Pittsburgh	1.25	1.25	1.40	2.25
Skelp, Sheared Iron, Pittsburgh	1.25	1.25	1.45	2.60
Sheets, No. 27, Chicago	3.15	3.15	3.10	3.18
Sheets, No. 27, Pittsburgh	2.95	2.95	2.90	3.00
Barb Wire, f.o.b. Pittsburgh	2.80	2.80	2.80	3.10
Wire Nails, f.o.b. Pittsburgh	2.20	2.20	2.30	2.50
Cut Nails, Mill	1.95	1.95	2.05	2.30
METALS:				
Copper, New York	16.37½	16.37½	16.25	18.50
Spelter, St. Louis	4.00	4.12½	4.10	5.50
Lead, New York	4.25	4.00	4.12½	4.55
Lead, St. Louis	3.95	3.95	4.07½	4.55
Tin, New York	32.50	33.50	31.50	32.00
Antimony, Hallett, New York	9.50	9.50	9.62½	9.75
Nickel, New York	55.00	55.00	55.00	56.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.84	4.84	4.84	4.85

Chicago. (By Telegraph.)

Office of The Iron Age, 1205 Fisher Building, }
Chicago, August 1, 1900. }

An almost entire change has appeared in the markets for finished material within the past two weeks. The activity, which began in Bars, has gone merrily on without ceasing until it has involved some immense tonnages in those products and has also overflowed a few surrounding hitherto parched areas with its refreshing movement. There is at this moment a deep concern on the part of many buyers to close for their coming needs—that is, those who have not already done so. Estimates of the amount of Bars sold here during the past two weeks are expressed by the representatives of large producers something like this: "I think it has been easily over 100,000 tons." "It is more than likely that 200,000 tons or more have been sold from Chicago for deliveries throughout the West." The buying has been eager and includes all sorts of consumers. Implement people have been prominent. Much material has been taken for railroad use. Car builders have been large purchasers, and manufacturers of all kinds using Iron and Steel have added their requirements to the aggregate. The market still has a large number of inquiries before it, and it is now the prospective purchasers who are insistent, and not the sellers, who are inclined to hold back. More than three months' business has been crowded within these two weeks. Prices have ceased to decline with the steady progress of the past two months and there has been some slight reaction. The uncertainty of future output of material is aiding materially in increasing the sales, as well as the very low prices that have been named.

Pig Iron.—The conference held last week between the Bessemer Furnace Association and the large Steel producers was watched with interest by the trade. The impression is that production of Pig Iron will be considerably reduced next month, and that this may possibly stay the much further recession of values. But the absence of any agreement to restrict does not offer much in the nature of assurance that the end is in sight. Buyers are no more certain that the right time has come to buy than they were two months ago. Inquiries have

not increased notably, nor are they more general. One Detroit, Mich., melter has bought 10,000 tons of high grade Iron for future deliveries from Ohio furnaces. One of the large Chicago Implement makers bought 1000 tons for August shipment and will soon be in the market again. There is the usual tonnage moving in response to purchases for quick shipment. Prices have not yet shown steadiness. They are again lower this week. Some sellers are announcing that they cannot accept any more business at going prices. Other makers who have been inclined to hold aloof are somewhat more eager for orders. The situation is quite mixed, in fact. But there is said to be little doubt that further decline will result in a widespread suspension of production. The output in the West will be considerably less in August than it has been in July. As revised, quotations are as follows:

Lake Superior Charcoal.....	\$21.00 to \$21.50
Local Coke Foundry, No. 1.....	17.00 to 17.50
Local Coke Foundry, No. 2.....	16.50 to 17.00
Local Coke Foundry, No. 3.....	16.00 to 16.50
Local Scotch, No. 1.....	17.50 to 18.00
Ohio Strong Softeners, No. 1.....	19.00 to 19.50
Southern Silvery, according to Silcon.....	18.85 to 19.35
Southern Coke, No. 1.....	16.85 to 17.85
Southern Coke, No. 2.....	16.35 to 17.35
Southern Coke, No. 3.....	15.35 to 16.35
Southern Coke, No. 1 Soft.....	16.85 to 17.85
Southern Coke, No. 2 Soft.....	16.35 to 17.35
Foundry Forge.....	14.85 to 15.85
Gray Forge and Mottled.....	14.35 to 14.85
Southern Charcoal Softeners, according to Silcon.....	18.35 to 19.35
Alabama and Georgia Car Wheel.....	22.35 to 23.35
Malleable Bessemer.....	18.00 to 19.00
Standard Bessemer.....	19.00 to 20.00
Jackson County and Kentucky Silvery, 8 per cent. Silcon.....	23.00 to 24.00

Billets.—One sale of 5000 tons of Bessemer Billets for Chicago delivery was made at a price considerably under \$20.

Bars.—There are sold annually at Chicago nearly 500,000 tons of Bars. Sales here during the past two weeks have probably been close to 200,000 tons. Perhaps the less said about prices the better. If reports are true, the buyers are very fortunate. The extreme low quotations started the movement on the part of consumers, which has now involved almost all of them either as inquirers or as actual buyers for a term in the future ranging from three to twelve months. There are some heavy inquiries in the market which are not yet closed. Representatives of some of the large mills have sold all they care to at prices named and the market is distinctly firmer in tone than a week ago. This strength has a further stimulus in the uncertainty respecting the operations of the Iron Bar mills. At this writing no conference has been called for a further consideration of the wage scale, and the possibility of a continued shut down has created quite a desire to increase holdings of stock. There is greater demand for Iron than can be filled for prompt shipment. The agent of one of the smaller Iron Bar mills said his inquiries for Bars last week amounted to 22,000 tons, and that on Monday, this week, they were 12,000 tons. Some of the inquiries were by wire, some by mail, and not a few by personal application. The city has been filled with out of town buyers during the past week. Some small Iron Bar makers are still quoting 1.40c. from mill. Steel is quoted at 1.30c., and some of the heavy business of the past week has been closed at prices considerably lower. From store both Iron and Steel are firm at 1.75c. and Hoops at 1.90c. to 2c.

Structural Material.—There is fair inquiry. Three or four large structures at Chicago are under consideration, but contracts for material have not been closed. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 2.05c.; 18 inches and over, 2.15c.; Angles, 3 inches and over, 1.95c.; Angles under 3 inches, 1.35c.; Tees, 2.10c.; Universal Plates, 1.35c. From local yards small lots of Beams and Channels are quoted 2.55c. to 2.75c.; Angles, 2.20c. to 2.30c. rates, and Tees, 2.40c. to 2.60c.

Plates.—The demand for Plates has improved quite notably. Transactions of a small nature have aggregated several thousand tons and many unfilled inquiries are in the market. Quotations are as follows: Tank, 1.35c. to 1.40c., and Flange, 1.70c. to 1.80c. From store Tank is quoted 1.65c. to 1.80c., and Flange, 1.90c. to 2c.

Merchant Pipe.—A good week in Pipe is reported, with prices unchanged, as follows:

Sizes.	Black.	Galvanized.
1/4 to 1/2 inch and 9 to 12 inches.....	61 2-10	48 2-10
3/4 to 8 inches.....	66 2-10	53 2-10

Sheets.—Prices are lower from store, and business has gained in volume. No. 27 Black are quoted 3.20c., and some prices are heard considerably lower still. There are a number of old stocks in intermediate hands for which holders apparently have no use. Galvanized Sheets are moving more freely at quotations remaining unchanged at 70 and 10 to 70 and 12 1/2.

Merchant Steel.—The situation has changed for the better in Merchant Steel. Consuming manufacturers have become quite active buyers and a heavy tonnage has been placed. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Tire, 1.80c. to 2c.; Open Hearth Spring Steel, 2.25c. to 2.50c.; Toe Calk, 2.50c. to 2.75c.; Sleigh Shoe, 1.75c. to 2c.; Cutter Shoes, 2.50c. to 2.75c.; Ordinary Tool Steel, 7c. to 7 1/4c.; Special, 13c. and upward.

Rails and Track Supplies.—For Light Sections demand continues fairly good, transactions being chiefly in small lots. The tendency of Fastenings is toward firmness. Nominally prices are as follows: Rails are \$35 to \$37 for Standard Sections, and \$30 to \$35 for Light Rails. Splice Bars, 1.50c. to 1.60c.; Spikes are quoted 1.80c. to 1.90c.; Bolts, with Hexagon Nuts, 2.40c. to 2.50c.; Square Nuts, 2.30c. to 2.40c.; Links and Pins, Steel or Iron, 2c.

Old Material.—Transactions in Old Material are few and unimportant. Mills generally are inclined to use up present stocks, some of the mill owners saying that when yards are cleaned up they may close down indefinitely. Whatever sales are made go to the yards of large dealers, who are buying against the future. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$12.50 to \$13.00
Old Steel Rails, mixed lengths.....	9.50 to 10.00
Old Steel Rails, long lengths.....	10.50 to 11.00
Relaying Rails.....	20.00 to 22.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	9.00 to 10.00
Mixed Steel.....	8.00 to 9.00
Iron Fish Plates.....	12.00 to 13.00
Steel or mixed do.....	11.00 to 12.00
Iron Car Axles.....	16.00 to 16.50
Steel Car Axles.....	14.00 to 14.50
No. 1 Railroad Wrought.....	12.00 to 13.00
No. 2 Railroad Wrought.....	10.50 to 11.00
Shafting, Iron and Soft Steel.....	15.00 to 16.00
No. 1 Wrought.....	9.00 to 9.50
No. 1 Country Wrought.....	8.00 to 8.50
No. 1 Mill.....	7.00 to 7.50
No. 2 Mill.....	5.50 to 6.00
No. 1 Busheling.....	8.00 to 8.50
No. 2 Busheling.....	7.00 to 7.50
Iron Car Axle Turnings.....	8.00 to 8.50
Soft Steel Axle Turnings.....	7.00 to 8.00
Machine Shop Turnings.....	6.50 to 7.00
Wrought Drillings.....	6.00 to 6.50
Cast Borings.....	4.00 to 4.50
Mixed Borings and Turnings.....	5.00 to 6.00
No. 1 Bolders, cut.....	8.50 to 9.00
No. 2 Bolders, cut.....	6.00 to 6.50
Boller and Ship Scrap.....	8.00 to 8.50
No. 1 Cast.....	10.00 to 11.00
No. 2 Cast.....	7.00 to 8.00
Railroad Malleable Cast.....	10.00 to 10.50
Agricultural Malleable Cast.....	9.00 to 9.50

Metals.—Trade for both Copper and Lead is confined to narrow limits, with prices unchanged at 16 1/4c. for Lake and 16 1/2c. for Casting. Lead is without activity at 3.95c. for Desilverized and 4.05c. for Corroding.

Philadelphia.

Office of The Iron Age, Forrest Building, (PHILADELPHIA, PA., July 31, 1900.)

The market has not changed very much since last week. Some days it looked better, other days it seemed duller, the net results being that things are practically unchanged, with prospects just about as indefinite as they have been for weeks past. There is more business, however, and although the lots are small, they are wanted immediately, showing that stocks are low and will require frequent replenishment. It is difficult to form any decided opinion as to the course of the market during the next three or four months, although in some lines it is tolerably clear that the decline has gone as far as it can go, unless there is a decided drop in raw materials. Plates and Bars at 1.25c. are out of proportion with other articles, so that whatever may happen as regards Pig Iron or Billets, it is not likely that Plates or Bars will go off much. In a general way there is better feeling, due to a well distributed demand. All departments of the consuming interests appear to be getting in more work; nothing rushing, but enough to keep them comfortably busy. This brings in a corresponding amount of business for Pig Iron, Bar Iron, Plates, &c., which, as we said before, is mostly in small lots, yet it prevents stagnation, and imparts a more hopeful feeling in regard to the final outcome. On the whole, therefore, developments during the week have been encouraging, with prices steady at about the same figures as quoted in our last report.

Pig Iron.—There is so little change in the market for Pig Iron that last week's report might almost be used verbatim. The demand appears to be in fair proportion to the supply, so that there is no great pressure for immediate realizations, although the majority of producers would like to have something on their books for winter delivery. Buyers are not disposed to go more than 60 to 90 days ahead of their requirements, however, so that

sellers have to wait for a market. It is believed that stocks are not increasing much, if at all, the current outgoings being a good offset to current production. The difficulty at the present time is to fix upon a basis of prices which will be satisfactory to both buyers and sellers, pending which the market is drifting along at about the same prices as have been quoted for two or three weeks past. There is a good deal of irregularity, however, not so much in prices as in qualities, as also in the conditions which govern many of the transactions. A fair average of the market would be about \$16.50 for No. 2 X Foundry. Some claim to get more, others are willing to take a shade less, but there is no pressure to sell, as the supply of good Iron is not large. The extreme range is as follows for tidewater or nearby deliveries: No. 1 X Foundry, \$17.50 to \$18; No. 2 X Foundry, \$16.25 to \$17; No. 2 Plain, \$15.75 to \$16; Mill Irons, \$14.25 to \$15; Ordinary, \$13.50 to \$14.

Billets.—Prices are irregular, in some cases \$21 being asked, while in others business could be done at very close to \$20, but there is not very much demand, as prices are still too high compared with finished products.

Plates.—There has been a fair amount of business entered during the past week, and as a rule at prices fully equal to those of the week preceding, although it is said that Western mills are sending in some very low quotations. A great many small and medium sized orders are coming in, the aggregate tonnage being quite a respectable amount. Inquiries denote a continuance of this class of business for some time to come, although for the present no large orders are in sight. Something is doing for export, and at present prices it is thought that a considerable amount of orders may be secured in the near future. Prices for small and medium sized lots are about as follows for nearby deliveries: Plates, $\frac{1}{4}$ -inch and thicker, 1.30c. to 1.35c.; Universals, 1.35c. to 1.40c.; Shell, 1.50c. to 1.55c.; Flange, 1.60c. to 1.65c.; Charcoal Iron Plates, C. H. No. 1, 2.40c.; Best Flange, 2.90c.; Fire Box, 3.40c.

Structural Material.—There is no change of feature to note in this department. The demand is of the same general character as noted during the past three or four weeks; lots of 50 to 200 or 300 tons, but nothing large in individual lots. The week's deliveries are fairly balanced by the week's incomings, but order books have not been gaining anything of late. Manufacturers claim that prospects are favorable, but it is evidently a waiting market for the present. Nominal prices remain as follows for seaboard and nearby points: Beams and Channels, 15-inch and under, 2.03c.; Angles, 3 to 6 inches, 1.93c.

Bars.—There is considerable pressure to secure orders, under which some very low prices have been quoted. Ordinarily 1.25c. to 1.30c. at mill is asked, but these figures and less have been accepted for lots (delivered) when they have been attractive as regards quantity or specification of sizes. Steel Bars can be had at something less than for Refined Bar Iron, but sales are not large.

Sheets.—Thin Sheets go quite freely, and mills are still busy in that department. Heavy Sheets are neglected, however, and prices somewhat irregular. Ordinary quotations are about as follows for best Sheets. (Common Sheets two-tenths less): No. 10, 2.30c.; No. 14, 2.40c.; No. 16, 2.50c.; Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

Old Material.—Business in this line is absolutely dead. Holders either have to wait until a buyer happens to want something, or accept prices which appear to be out of all reason. The following figures for deliveries in buyers' yards are as near the market as can be guessed at, as no actual sales can be reported except Machinery Cast at \$13 to \$14, which article appears to be in demand at about \$13: Choice Railroad Scrap, \$13 to \$14; No. 1 Yard Scrap, \$11 to \$12; No. 2 Light Scrap, \$10 to \$10.50; Machinery Cast, \$13 to \$14; Heavy Steel Scrap, \$10 to \$11; Old Iron Rails, \$14 to \$15; Old Steel Rails, \$12 to \$13; Wrought Turnings, \$8.50 to \$9; Cast Borings, \$6.50 to \$7; Old Car Wheels, \$17 to \$18; Iron Axles, \$15 to \$16; Steel Axles, \$16 to \$17.

St. Louis. (By Telegraph.)

Office of The Iron Age, 1305 Chemical Building,
St. Louis, August 1, 1900.

Pig Iron.—Taken as a whole, it may be said that an appreciable improvement is had in demand. It is, however, but fair to mention that purchases are not running much beyond single car lots. The largest known order was for a trifle under 200 tons, and that followed an original inquiry for 2500 tons. An agricultural implement concern was the buyer, and it was said had intended buying for 12 months, but owing to the range of

prices had from sellers, concluded to cover a month's run only. From the car lot sales effected the trade say foundries are undoubtedly beginning to scratch soil in their stock yards. Nevertheless, the diminishing stocks have not rendered buyers less cautious. Stove works are now running in a moderate way. Jobbing and general foundries are fairly busy. Prices below represent further declines, but the principal Southern producer still holds to higher figures than here mentioned. We quote, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$17.25 to \$17.50
Southern, No. 2 Foundry.....	16.25 to 16.50
Southern, No. 3 Foundry.....	15.25 to 15.50
No. 1 Soft.....	17.25 to 17.50
No. 2 Soft.....	16.25 to 16.50
Gray Forge.....	14.75 to 15.00

Bars.—Trade in Bars appears to be improving. Some fairly good tonnage has been sold to Missouri River points the past week, included in which specifications for Plates are to be mentioned. It is well known that for some weeks past it was practically impossible to effect sales beyond buyers' needs. That condition seems now to be terminating. Present Eastern prices of Steel Bars seem to be approximately within \$4 per ton of the lowest prices quoted in *The Iron Age* in July, 1897. It would seem that no further concessions could be made in view to to-day's increased costs of Ore, fuel and labor. Orders to jobbers are quite encouraging and those for this month will compare very favorably with sales during July of past years. It is evident that stocks in consumers' hands are being well drawn upon and that jobbers in turn are called upon for prompt shipment of orders. There is uncertainty about the time when mills will resume operations. Meanwhile such inquiries as received by them for prompt deliveries come to naught. For such stock as mills have on hand they quote about 1.40c., half extras, for Iron; Steel, 1.35c., half extras, according to tonnage. Iron and Steel out of store remain about 1.75c. to 2c., full extras. These prices can be shaded, however, to a considerable extent by carload buyers.

Rails and Track Supplies.—Inquiry is brighter for Track Supplies, and figures have been asked on good quantities. Some carload business has been closed up on Spikes. We quote Splice Bars, 1.90c.; Track Bolts, with Square Nuts, 2.50c.; with Hexagon Nuts, 2.70c.; Spikes, 2c.; Links and Pins, 2c.

Pig Lead.—No snap to the market. Sales seem few; 3.95c. is quotable price for all kinds. Lead Ore remained at \$43 per net ton.

Spelter.—Shrinkage in value again noted. Price is back to that quoted prior to the La Harpe labor trouble; 4c. to 4.05c. is nominally the price. The top price for Zinc Ore was stationary at \$28 per ton.

Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets,
CINCINNATI, August 1, 1900.

Despite the fact that Pig Iron is still settling there is a very much better feeling to the market than for some time past. The amount of inquiry has increased very materially and there has also been more selling. Several lots of 100 to 500 tons are reported, also one of 5000 tons Coke Malleable for delivery in this territory throughout the next ten months in regular installments. Also 1500 tons same to be delivered 500 tons each month for the next three. These sales are reported made at full current quotations and are regarded as significant of a much firmer condition. While there is a strong feeling that prices are about as low as they are likely to go at this time, yet it is not thought probable that the market will be other than quiet for the next few weeks. Freight rate from Birmingham is \$3.25 to this point, from the Hanging Rock district \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$16.50 to \$17.00
Southern Coke, No. 2.....	15.50 to 16.00
Southern Coke, No. 3.....	14.50 to 15.00
Southern Coke, No. 4.....	13.50 to 14.00
Southern Coke, No. 1 Soft.....	16.50 to 17.00
Southern Coke, No. 2 Soft.....	15.50 to 16.00
Southern Coke, Gray Forge.....	13.50
Southern Coke, Mottled.....	13.50
Ohio Silvery, No. 1.....	20.00 to 21.00
Ohio Silvery, No. 2.....	19.00 to 19.50
Lake Superior Coke, No. 1.....	16.50 to 17.00
Lake Superior Coke, No. 2.....	15.50 to 16.00
Lake Superior Coke, No. 3.....	15.00 to 15.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, Chilling grades.....	\$22.50 to \$23.25
Standard Southern Car Wheel, No. 2.....	21.50 to 22.00
Lake Superior Car Wheel and Malleable.....	20.00 to 21.50

Plates and Bars.—There is no change reported in quotations. The market is quiet, but with a very material improvement in tone. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 1.60c., with half extras; in small lots, 2c., with full extras; Bar Steel, carload lots, 1.70c., with

half extras; small lots, 2c., with full extras; Iron Bar Angles, $1\frac{1}{2}$ x 3-16 inch and larger, in car lots, 1.75c.; small, 2.25c.; Sheets, No. 10, 2.25c.; No. 27, Steel, 3c.; Plates, 2c. to 2.25c.

Old Material.—The market has been very quiet and the outlook shows no immediate change expected. We quote dealers' buying prices per gross ton, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, \$11 to \$12; Cast Railroad and Machine Scrap, \$10 to \$11; Iron Axles, \$14 to \$15; Iron Rails, \$12 to \$13; Car Wheels, \$14 to \$15.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building,
Pittsburgh, August 1, 1900.

(By Telegraph.)

Pig Iron.—There is a better inquiry for Foundry Iron, and sales of Standard No. 2 are being made right along at \$15 to \$15.10 at Valley furnace. These prices are equal to about \$15.75 to \$16, Pittsburgh. We can note a sale of 300 tons of No. 2 Foundry at \$15 at furnace. An item of interest is that several large consumers of Foundry Iron have offered to contract for their supply for the first six months of next year at practically present prices. So far none of the furnaces will accept the offer, as the cost of making Foundry Iron for the first six months of next year will be considerably higher than it is now. There is no demand for Forge Iron, nearly all the mills being closed; and we quote nominally at \$15 delivered, Pittsburgh, for Standard grades. It is possible this price might be shaded on a firm offer. There is nothing doing in Bessemer Iron, except an occasional sale of a few tons at \$16.50 to \$17, Pittsburgh. Nothing was done at the meeting of furnace interests held in Chicago last week. Several Valley furnaces have blown out recently, and there promises to be a very large reduction in the output of Pig Iron in the near future.

Billets.—There is nothing of interest to report. Not enough Steel is being sold to fix a market price. In the absence of sales we quote Bessemer Billets nominally at \$19; Basic Open Hearth Billets of ordinary carbons are \$21 to \$22 and up to \$25 for high carbons.

Sheet Bars.—We quote Light Sheet and Tin Bars, cut to length, at \$23 to \$23.50, Pittsburgh. Long Bars, random lengths, are about \$22, Pittsburgh; but this could probably be shaded.

Iron and Steel Scrap.—The Scrap market is practically lifeless, owing to the fact that the mills of the two principal consumers are idle, and we omit quotations.

(By Mail.)

As expected, nothing was done at the meeting of the Pig Iron and Steel interests, held in Judge Gary's office in The Rookery, Chicago, on Thursday and Friday of last week. The scheme, as proposed, to cut down production is generally regarded as impracticable. A meeting of the Bessemer Furnace interests is being held today (Tuesday) in Cleveland, and it is possible some plan will be devised by which the production of Pig Iron will be very materially curtailed. Aside from the above, the principal item of interest is the tremendous tonnage in Steel Bars placed with the large mills in the past two weeks. All the leading manufacturers, such as Carnegie Steel company, American Steel Hoop Company, Republic Iron & Steel Company, and others, have been large sellers, and very low prices have been made, probably below the present cost of production. In the other lines of Iron and Steel there is a moderate volume of trade, but a good deal more inquiry all around, with the exception of Pig Iron and Steel. These continue very dull, not enough of either being sold to fix a price. It is generally believed that August, and perhaps September, in the Iron trade will be very quiet, but a much better tonnage is expected in the last quarter of the year.

Rods.—We were in error last week in stating in this report that Bessemer Rods had been offered under \$30 f.o.b. Pittsburgh. Two leading interests are reported to be holding Rods firmly at \$35 at mill, and moderate sales are being made right along at this price.

Ferromanganese.—We continue to quote 80 per cent. Ferro at \$85, delivered. In view of the rapidly declin-

ing market on Pig Iron and Steel, and Finished Material as well, it looks very much as though the price of Ferro will have to be lower.

Bars.—A tremendous tonnage in Steel Bars has been placed since our last report. Conservative estimates put the amount above 100,000 tons. All the large Steel Bar interests have been heavy sellers, and as a result there has been a slight reaction, and the price of Bars to-day, as compared with last week, is considerably firmer, and possibly \$1 or \$2 a ton higher. All sorts of rumors are going at to prices, and it is claimed that 90c. has been done in exceptional cases for very desirable tonnage. This, however, is strongly denied by several of the leading mills, who claim not to have sold below 1c. The bulk of the business has probably been taken at 1c. to 1.05c., and it is certain that no tonnage could be placed to-day, however large and desirable, below 1c., and it might be difficult to find sellers at that price. Nearly all the large consumers of Bars have covered their wants for balance of the year, and in some cases into the first half of next year. The general market on Steel Bars is 1.05c. to 1.10c., but on very desirable specifications and large tonnage it is possible that in exceptional cases 1c. at mill could be done. There is also a better demand for Common Iron Bars, and we quote at 1.25c. to 1.30c. Pittsburgh.

Plates.—Several of the leading mills advise us that they think the tone of the Plate market is slightly stronger. Plates in large tonnage have sold at 1.05c. or less, but the market on Sheared, $\frac{1}{4}$ -inch and heavier, is 1.10c. to 1.15c. at mill. Shell is 1.20c. to 1.25c.; Flange, 1.30c. to 1.35c.; Fire Box, 2.25c. to 3c.

Structural Material.—The leading interest, the American Bridge Company, are reported to have taken some very large contracts for bridges in the past week or two, and also some contracts for buildings. The amount of tonnage being placed, considering the lateness of the season, is remarkable, and the Structural mills are all pretty well filled up. A new interest are in the market as sellers of Beams and Channels up to 12-inch, and are shading the Association price. We quote: Beams and Channels up to 15-inch at 1.90c.; over 15-inch, 2c.; Angles, 3 to 6 inch, inclusive, 1.80c.; over 6-inch, 1.90c.; under 3-inch, 1.60c. to 1.70c.; Zees, 1.90c.; Tees, 1.95c.; Bars, 1.05c. to 1.10c.; Universal and Sheared Plates, 1.10c. to 1.15c., all f.o.b. Pittsburgh. As noted above, our quotations on Beams and Channels up to 12 inches, and also on small Angles, are being slightly shaded by an outside mill.

Merchant Steel.—The Crucible Steel Company of America have been fully organized, and headquarters are on the eleventh floor of the Empire Building, Pittsburgh. Trade continues quiet, buyers placing orders only for small lots. We quote: Tire Steel, 1.75c. to 1.80c.; Toe Calk, 1.85c. to 1.90c.; Open Hearth Basic, 2.25c. to 2.35c.; Plow Slabs, 1.80c. to 1.90c.; Rolled Lay Steel, 2.75c.; Hammered Lay Steel, 3.10c. to 3.25c.; Tool Steel, ordinary grades, 7c. and upward, depending on quality. Terms are 60 days, 2 per cent. off for cash in 10 days, and on Tool Steel 25c. freight is allowed. The above prices are nominal, and would likely be shaded for good orders.

Sheets.—The principal demand in this trade just now is for Sheets for corrugating purposes. The leading interest continues to quote 3.20c. for No. 28 one pass, and 3c. for Corrugating. These prices, however, are being shaded by outside mills. No. 28 one pass being sold as low as 3c. We quote Galvanized Sheets at 70 and 10, $\frac{1}{2}$ per cent., 15c. freight.

Skelp.—There is some inquiry for Skelp, and some tonnage has been placed in the past week or two. We quote Grooved and Sheared Iron and Steel Skelp at 1.25c. at mill. We can note a sale of Skelp for Boiler Tubes at that price.

Pipes and Tubes.—There has been some tonnage placed in Line Pipe, sales of about 25 to 30 miles of small sizes being reported, and also a few lots of large sizes. The general demand for Pipe, however, is for small lots only. Prices are being fairly well maintained, but in some cases are being shaded by outside mills. Prices on certain sizes of Merchant Pipe have been slightly reduced. Consumers in carload lots are now quoted as follows:

Merchant Pipe.		Black.	Galvd.
		Per cent.	Per cent.
$\frac{1}{2}$ to $\frac{3}{4}$ inch and 11 x 12 inch.....	63	50½	
$\frac{3}{4}$ to 10 inch.....	70½	58	
Casing.		S. & S.	
		Per cent.	
2 to 2½ inch.....		42	
3 to 4½ and 7½ to 12½ inch.....		50	
4½ to 7½ inch.....		60	

Boiler Tubes.

Steel.	Up to 22 feet.	22 feet and over.
	Per cent.	Per cent.
1 inch to 1½ inch and 2½ inch.....	50	45
1½ to 2¼ inch.....	42	36
2½ to 13 inch.....	55	50
Iron.		
1 inch to 1½ inch and 2½ inch.....	45	40
1½ inch to 2¼ inch.....	40	34
2½ inch to 13 inch.....	52½	47½

Prices to jobbers are about 5 per cent. less than the above.

Connellsville Coke.—Production of Coke in the Connellsville region is being regulated to meet the actual demand, as much as possible. A feature of the Coke market at the present time is that several concerns who have been large consumers of Coke heretofore are now sellers, and are offering surplus Coke on the market. The Eureka Fuel Company, a Federal Steel Company interest, are making Coke at 128 ovens at Leckrone, and will in a short time have 300 more ovens producing at the same works. This Coke is claimed to be very high in quality. Out of 20,420 ovens in the Connellsville region, 16,106 were active last week and 4314 idle, the output having been 165,468 tons. There is not much demand for either Furnace or Foundry Coke. Two blast furnaces in the East have recently started up and are receiving regular shipments of Furnace Coke. We quote standard Connellsville Furnace Coke at \$2 and 72 hour Foundry Coke at \$2.75, and Crushed from \$3 to \$3.25, all in net tons at oven.

Cleveland.

• CLEVELAND, OHIO, July 31, 1900.

Iron Ore.—Although the movement of Iron Ore down the lakes is confined largely to the contract tonnage, there is a brighter aspect to the market. The establishment of the price of Ore for the last half of this year has tended to increase the amount of it being sold, with the result that the movement is slightly heavier. This does not affect materially the general carrying trade, because most of the Ore that is to be brought down this year was sold earlier, but it will affect the wild rate inasmuch as about all that is sold from now on will have to be moved by the wild tonnage, therefore increasing the demand for it. Another element that will in time stiffen the wild Ore rate is the withdrawal from Ore carrying of the lumber hookers, which have been attracted to the business for which they are designed by the fact that this movement is now increasing every day, as a result of recent heavy sales. This small tonnage has been caring for the movement of Ore heretofore, doing away with the urgent need for large boats in the Ore trade. With the small boats in other lines the shippers, if they move their stuff, must bid for the larger tonnage. To get some of this it will be necessary to pay higher wild rates, although there are a good many of the big boats that are satisfied with prevailing freights. All of this, however, is prospective and has nothing to do with the market that exists, other than it reflects the feeling of the vessel owners and the tendencies that prevail. For the present the market is quiet. The shippers have orders now for but little more Ore than they have contract tonnage with which to carry it. A few cargoes are being shipped now and then from Escanaba and occasionally a cargo or so comes down from Marquette, but the movement from Duluth and Ashland by wild boats is decidedly small. The supply of tonnage with which to move this is exactly the reverse. Tonnage might be said to be a glut on the market as far as the movement of Ore is concerned. Since the mine operators gave the shippers instructions to be light in the movement of Ore the market has been very weak. Had the shippers any stuff to move or were they at all anxious to break the rate it would be but little trouble to do so. The reports of the sales agents are that there is an increased demand for their product, and the entire market has taken on a new face in the last few days. While no very heavy sales have been made the inquiries are large, showing an increased interest in the buying quarters. These inquiries have given rise to the hope that the Ore movement will yet be as heavy this year as it was at first believed. In the face of this more hopeful feeling comes the report that small furnaces are being forced out of business by the lowering prices restricting the consumption of Ore just that much.

Pig Iron.—The tide has at last turned in the movement of Pig Iron, and business is rather brisk. In this territory it is still being hampered by the prevalence of the strike among the molders, which prevents any great amount of melting being done, but on the other hand those who had Pig Iron and who were not buying on account of the price are now running out of stock and are demanding Iron and that at once. The prices prevailing on these sales are \$16.50 on No. 1 and \$16 on No. 2, at the

furnaces, the freight to Cleveland being 90c. The sales for spot delivery have been heavier this week than for weeks in the past. The buyers are not taking any large quantities nor are they buying in advance, but they are supplying their present needs liberally. This week has also seen an increase in the demand for the latter half of the year. The indication appears to be that Pig Iron has settled upon a basis on which business may be done. The increased business in finished materials and the establishment of the price on Iron Ore has put an ever so much firmer footing on the Pig Iron market, with the result that buyers are commencing to look around for future delivery. The inquiries have not been enormous, but they have been sufficiently heavy to denote a growing interest in the business for the remainder of the year. Nothing definite is told here of the results of the Chicago meeting, at which it was expected the furnacemen would decide on their future policy regarding the production of Pig Iron. One thing alone is apparent. The amount of Pig Iron produced is steadily on the decline, but this does not mean necessarily the presence of any general movement to restrict production. In fact it cannot be said that so far there is any general or concerted movement to curtail the amount of Iron produced, but the circumstances which were created by the market itself have forced the reduction of the amount of Iron produced by putting the price down where certain furnaces cannot live. These furnaces are going out of blast, a few of them being heard of each week, each one leaving the market a little stronger than it was with them at work. There have been practically no sales of Bessemer made, the market for which has changed in no respect whatever, and is about the dullest factor in the entire trade.

Finished Materials.—The buying season is surely on now. The sales have been rather heavy for the last few weeks, but this week has surpassed any of them. It seems like a steady progression toward an enormous business. Heretofore the business has been more or less restricted to certain grades, but now it has spread to all grades, the market generally being brisk. The sales of Plates, Bars and Billets have been especially heavy, and while the prices have been low the market has been good all around. It had been hoped that by this time the prices of Bars and Plates would be slightly increased, seeing the extra demand for them, but instead the market has shown a decline in Bars. Some business in Bars has been known to have been done at 1c., although the standard mills refused to touch it at that. Plates have been subject to no such price, being held firm at 1¼c. Billets have been quoted at \$21.50, although there are some reports that the price here has also been reduced, but no great amount of business was done at the lower figure. The increase in the amount of business done is attributed partly to the low rates at which sales have been made, but the buyers have not shown any tendency to speculate but have been buying for immediate use. All believe that this is the speculators' season, but none of them have shown any desire to take advantage of it at once. The feeling is, therefore, that the increased sales mean merely a very healthy market. The sales of Structural Materials have been very heavy. Beams and Channels remain firm at 1.90c., with no disposition on the part of the buyers to try to break the price. This is about the strongest part of the market. Angles are selling at 1.80c., with some efforts to break the agreed price, but without success so far.

Birmingham.

BIRMINGHAM, ALA., July 30, 1900.

"Japhet in search of a father" could not have been more puzzled in his difficulties than is the seeker after the true condition of the Iron market. The past week it was practically in a condition of "innocuous desuetude." Everything along the line was dull. Those large purchases, now overdue, and which were to turn the tide of affairs, have not materialized, and the small buyers are confining themselves strictly to absolute necessities. Some declare they have sold no Iron below \$14 for No. 2, but say they have had none but small order trade. Some admit making sales at \$13, while it is a dead moral certainty that it has been offered at \$12.50 without creating the desire to own any great amount of it. Inquiries are reported by some as very fair, while others report them as poor. None report any transaction of significance.

A singular fact concerning our Iron has developed since the decline has become serious; and that is its poor quality. But this complaint comes from buyers who got in at higher figures, and who are trying to get out even by pickling flaws in grades. The truth is Iron never was so carefully graded and never so literally fulfilled contracts as that shipped from this district in the last six months.

The export trade has "slumped." Conditions all at once became against it, and although some inquiries were on the market they led to no business.

Mention has been made of a recent discovery of specular Iron Ore, stratified, of great dimensions and high in metallic Iron. It is located on the Alabama Mineral Railroad, a branch of the L. & N. Railroad, and about 40 miles east of Birmingham. The Ore will be a great boon to the East Alabama furnaces, giving them a fine mixture to go with their brown Ores. A company have been formed and incorporated, composed of local and Eastern parties, under the name of the Eumawhee Mining Company, to work these mines. There is scarcely a limit to their capacity, and the extent of their working will keep pace with the demand for the Ore. The mines will be connected at once to the railroad by a spur track and operations begun immediately. Within a stone's throw of the mines is a large deposit of marble, running 98 per cent. of carbonate of lime, while paralleling the vein of specular Ore is a true lead of high grade brown Ore. The property is a very valuable one, and the wonder is that it has so long escaped the attention of prospectors and investors.

The Tennessee Coal, Iron & Railroad Company's report of earnings for the six months ending June 30 is a very favorable one, showing an increase over the corresponding period last year. The net earnings, six months, 1900, were \$1,790,099. The net earnings, six months, 1899, were \$509,862, showing an increase of \$1,280,237. The surplus for the month of June was \$129,260, as compared with \$69,896 in June, 1899. The surplus for the six months ending June 30 was \$1,461,439, as compared with \$230,484 for the same period last year. This increase in surplus amounts to about 6 per cent. on the common stock.

A very important deal in brown Ore properties was consummated the past week when the Sloss Iron & Steel Company purchased of Morris Adler and associates all their holdings in what is known as the Franklin County brown Ore fields, paying therefor the sum of \$300,000. This fills "a long felt want" with the Sloss people, and not only transfers to them an exceedingly rich and extensive field of brown Ore, but it enables them to place it at furnace at a cost that is beyond competition. This week they will blow in the Lady Ensley Furnace at Sheffield. In their report of earnings for the first six months of this year they show net earnings of \$741,182 from which after deducting interest on bonds, \$101,187, there is left \$639,995. From this is deducted dividend of \$234,500, which leaves a surplus of \$405,395; and this amounts to about 5.39 per cent. on the common stock. These reports of our two leading companies dispel the illusion as to the exaggerated profits in Iron making. "The reefs may be full of gold, but it takes a lever of gold to get it out."

The sensational suit against Rogers, Brown & Co. by the owners of the Trussville Furnace Company for \$100,000 damages excited considerable comment. Garnishments for \$100,000 were sworn out, but they fell to the ground, as the plaintiff could not give bond. The main facts of the case are in the possession of your correspondent, and in justice to a firm that never "fluked" on a contract or played the baby act in any of their transactions, are given as follows:

An option was obtained by R. D. Smith on the Trussville Furnace property from the old bondholders at \$75,000, and sold by him to the new company, of which he became president, for \$90,000. The new company then voted that their purchase was worth \$340,000, and capitalizing it at \$250,000, for which stock was issued, assumed the \$90,000 as a liability. A payment of \$30,000 was made by the Perrys to the Trussville Company, and \$100,000 of stock was issued to them. Then the Perrys received also the notes of the Trussville Company for the \$30,000 paid in, and which went to the old bondholders. This reduced the debt on furnace to \$45,000. The \$30,000 notes of the Trussville Company were discounted partly here and partly in New York, and thus a capital was created with which to start the furnace, and \$50,000 was soon absorbed. Iron was high and the profits great, Rogers, Brown & Co. having contracted, in advance, for the output which was to be standard. The furnace did not go into blast until four months after the appointed time. Up to July 1 16,000 tons should have been delivered to Rogers, Brown & Co., whereas they received but 1000 tons, which was below standard grades. Non-delivery forced Rogers, Brown & Co. into the open market to supply sales made against Trussville output, entailing a loss. Their affairs were thoroughly investigated and the contract canceled because of non-fulfillment.

In the meantime the furnace has been banked two weeks with little or no prospect for resumption and staggering under a heavy burden of debt with clamorous creditors seeking a *point d'avantage*, where they can serve legal papers. The incident "points a moral and adorns a tale."

The above outline, though incomplete, is solidly true, and each one can make up his own verdict. No one here familiar with the facts entertains any doubt as to the outcome of the suit.

The British Iron Market.

Pig Iron.—Although there is still no great weight of business passing in the Pig Iron market at present, there is a distinct further improvement in the general tone, and everything seems to point to an early and substantial revival of business. This season of the year is never a busy one and makers are by no means perturbed to find the demand somewhat restricted. They have a goodly show of orders on their books, and altogether their position is so strong that they can afford to await with equanimity the beginning of the buying for autumn delivery. Prices have, on the whole, been strongly upheld and few concessions have been made, no pressing necessity to sell having been experienced. There is a falling off in the shipments from the Cleveland district, but that is due more to the strike at Rotterdam than to any actual decline in business. Buyers are offering 68 shillings 3 pence for Cleveland warrants, one month, but there are no sellers. No. 3 still stands at 69 shillings. The Glasgow market was closed from Thursday till Tuesday, when it reopened with a very quiet business. The reluctance of holders to sell sent Scotch warrants up to 70 shillings 4 pence. They are now quoted at 72 shillings 6 pence.

Manufactured Iron and Steel.—There is no very striking alteration to report in respect of the finished branches of the Iron and Steel trades. Consumers continue their attempts to place orders at lower rates, but makers as a whole are holding their own fairly well, the high cost of production rendering it almost impossible in many cases to make any material reduction if rates are still to be remunerative at all. The Pearson & Knowles Coal & Iron Company, Warrington, however, have lowered their quotations for Plates, Sheets, &c., and Common Iron in South Staffordshire has sold at £10 10s., although some manufacturers are holding out for full rates, and all refuse £10 5s. Makers still have plenty of orders on their books, but new business continues scarce, buyers holding off in the expectation that producers will eventually be compelled to make concessions all round. The feeling at the Birmingham quarterly meeting last week, however, was decidedly against any reduction and the official lists were unaltered.

Engineering and Shipbuilding.—The engineering trades present no new features. Establishments as a rule continue fully engaged on work in hand, and although in some branches new orders are not coming forward so freely, there is no near prospect of any general slackening off. The satisfactory position as regards present activity is reflected in the usual monthly returns of the engineering trade unions, which show a continued exceptionally low percentage of out of work members. Shipbuilders are fairly well employed, on the whole, although vacant berths on the Clyde are numerous.

Foreign.—The decision of Northern ironmasters in France to accept no business below official quotations has not had the desired effect of stimulating business, and consumers are so little disposed to pay rates which they believe are not warranted by the present condition of the industry that they are beginning to accept the offers of foreign manufacturers, with the result that several orders have gone to Belgium and Germany. The situation of the Rolled Iron trade in Belgium has undergone no change and there seems to be an entire absence of orders of any importance, and business is limited to a few small parcels. The mills and forges are running irregularly, and some of them are in operation only five days a week. An excellent tone continues to characterize the Rolled Iron trade in Germany, where a brisk demand is being experienced for all descriptions of material and prices are firmly upheld on their recent level.

Comparison of Prices.—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

	July 19, 1900.	July 12, 1900.	July 20, 1899.
	s. d.	s. d.	s. d.
Iron Ore—			
Rubio, Middlesbrough ...	21 6	21 6	17 0
Rubio, Cardiff	20 6	20 6	15 9
Pottery Mine, North Staffordshire.	20 6	20 6	14 6
Hematite, West Coast (at mines) ..	17 6	17 6	16 0
Pig Iron—			
No. 3 Foundry, Middlesbrough ...	69 0	69 0	71 0
Warrants	68 3	...	71 2
Scotch Warrants, Glasgow ..	72 6	69 10	71 0
Hematite Warrants, West Coast ..	83 4	83 6	...
Cold Blast (Foundry), South Staffordshire	130 0	130 0	110 0
Welsh Hematite, Cardiff ..	84 0	90 0	75 0

Manufactured Iron and Steel—	£	s.	d.	£	s.	d.	£	s.	d.
Marked Bars, South Staffordshire	11	10	0	11	10	0	9	0	0
Common Bars	10	15	0	10	15	0	8	0	0
Steel Rails, Middlesbrough	7	12	6	7	12	6	5	7	6
Steel Rails, West Coast	7	7	6	7	7	6	5	7	6
Steel Rails, Cardiff	7	5	0	7	5	0	5	15	0
Steel Angles (eng.), Middlesbrough	8	15	0	8	15	0	7	2	6
Steel Angles (eng.), Glasgow	8	5	0	8	5	0	7	0	0
Steel Plates (ship), Middlesbrough	8	7	6	8	7	6	7	10	0
Steel Plates (ship), Glasgow	8	7	6	8	7	6	7	10	0
Tin Plates, Bessemer IC Cokes, South Wales		s.	d.		s.	d.		s.	d.
		25	6		15	3		15	3

—The Iron and Coal Trades Review, London, July 20, 1900.

The Belgian Iron Market.

BRUSSELS, July 18, 1900.—Your correspondent has sent no letter since the one which was published in *The Iron Age* on June 14, because he was expecting every day to be able to announce some very important news, as will be seen below.

Some Iron and Steel makers, seeing that the export trade was going from bad to worse, conceived the plan of forming a company for the exclusive sale of their products similar to those that are operated in France. This plan originated at Hainaut, and was supported by the most important firms of Liège. After many meetings, held at Brussels, the project seemed on the point of materializing, and at the news of its probable success prices advanced; but at the last moment several manufacturers from Liège declared they could not enter into the combination unless it comprised equally sales for the interior of Belgium. This new proposition, however, met with a strong opposition from firms whose trademark is well known and who have, to some extent, monopolized the supplying of the Belgian works and who pay higher prices than the foreign houses. Each party insists on its own way of thinking, and it looks as if nothing will be accomplished. Deliberations, however, are still going on. There is to-day, July 18, a meeting of all those interested, but your correspondent does wish to wait for the result, as he fears it will come to naught. The Belgian Iron manufacturers, in fact, are jealous of one another, and distrust one another, and this is the true cause of the failure to come to an understanding. The same want of cohesion was demonstrated months ago, when some of them had formed a plan, certainly advantageous to all, to buy conjointly coal in England, but the project was a dismal failure.

The situation has certainly become worse in Belgium since our last correspondence, that is, since two months. Most of the rolling mills work only during the day, having stopped night work, and moreover they don't work Mondays, often suspend operations on Tuesdays and sometimes even include Wednesdays. There is consequently a falling off in the consumption of Pig Iron, Blooms, Billets and Scrap Iron. The stocks of Pig Iron are becoming very large. Already one of the blast furnaces has shut down, and rumors are circulated of others following suit. Refined Pig Iron from Charleroi, which sold at from 110 to 115 francs two months ago, has to-day dropped to 90 francs, and it is predicted that it may sink to 70 francs before the end of the year, the more so as our exports of Pig Iron are decreasing and importations rather increasing.

Blooms and Billets are being stocked, as the supply is greater than the demand and prices are naturally weakening. Best Blooms are easily had for 150 francs and the best Billets for 155 to 160 francs, and a further drop of values is predicted. Scrap Iron is plentiful, although exportation has materially increased. Best Scrap can be had for 80 francs per ton.

The export movement is unsatisfactory, and very few new orders are coming in.

Orders for the interior of Belgium continued favorable for a longer period, but to-day the situation is quite changed. The Belgian rolling mills are suffering, even in Belgium proper, from foreign competition, and your correspondent has personal proof of it, having seen an offer of Steel Beams made by a large German mill at 185 francs per ton, f.o.b. Belgian works.

Owing to the scarcity of orders and principally to the reduced prices construction works are anything but busy. The Nail works and Bolt works are forced to suspend operations several days per week.

To all these unfavorable circumstances we must add that labor continues very high and cannot be cheapened on account of the prosperity in the coal regions and of the high wages that are paid there, for if an attempt were made to lower wages the Iron workers would go to the coal mines, where they are short of hands.

As a climax of misfortune many of the Iron works had to renew their contracts for coal the first of the month. They had hoped that the coal operators would grant them a reduction in consideration of their unfortunate situation, but such was not the case. The coal operators obliged them to renew contracts for three

months at former prices, which are as follows: Mixed at 25 francs per ton; small, 22.50 francs; coal dust, 20 francs. There was no use in trying to obtain coal from abroad, where it is also scarce and high. What a misfortune it is that the United States will not seriously organize regular sales for their coals in Belgium! They would be able to sell all they cared to.

The Coke syndicate has not been as lucky as the colliers. It had contracted to furnish Coke to the blast furnaces of Belgium at 25 francs per ton for the entire year 1900. This has been a bad deal, as Coke now sells at 35 francs, and even at 40 francs. The syndicate has since tried to induce the blast furnaces to close contracts for 1901 at 35 francs, and in order to equalize prices for 1901 with those of 1900 to make it an average price of 30 francs for the two years. But in view of the present precarious condition of their industry and the forebodings of the future the blast furnaces have wisely refused to treat upon the proposed basis. They will, therefore, continue to pay but 25 francs for their Coke until December 31, and will then look for a new arrangement. We mention this for the benefit of the American Coke manufacturer, who might utilize it by entering into communication with the blast furnaces of Belgium.

If the Belgium Iron works had to produce and sell at current market prices they would certainly lose money, but, luckily, they have still old contracts to fill, both for raw material and finished products, and we, therefore, estimate that most of them continue to earn a net profit of 15 to 20 francs per ton for Finished Iron and Steel.

The stock taking on June 30 by the greater portion of the metallurgical companies has shown that this year has been the most successful in 25 years. One case was pointed out to your correspondent on the Exchange of a small rolling mill owner of Charleroi who had but 1,000,000 francs invested and who cleared 650,000 francs that year. But since then what a decline!

This decline is not only attributed to the events in South Africa and China, or to the advance in freight rates resulting therefrom, not only to the poor crops in a number of countries, or to the bad economic condition of Russia, to the plague which continues to desolate British India, but as much to the progress of American competition. We have thereby completely lost the Japanese markets, and our Plate makers complain of American shipments to Holland, and our Rail makers of shipments to Turkey, to Eastern Europe and even to England.

The United States, however, up to the present day, do not send much to Belgium, as will be seen from the following table of our imports from your country given in metric tons:

	1900.	First six months.	1899.	1898.
Pig Iron	6,036	6,319	2,790	
Wrought Iron	20	41	14	
Old Iron	879	210	212	
Billets	0	0	327	
Steel Wire	273	0	13	
Merchant Steel	70	86	69	
Wrought Steel	48	45	17	
Galvanized Iron	2	2	3	

We learn from the above that all the items are insignificant with the exception of Pig Iron, and to some extent also Old Iron and Steel Wire. Besides there is but little progress between the years 1900 and 1899.

As usual we enumerate below the prices of the different products in francs per metric ton for June 18, 1900; July 18, 1900, against July 18, 1899:

	July 18, 1900.	June 18, 1900.	July 18, 1899.
No. 3 Luxemburg Foundry Iron	100.00	115.00	85.00
Luxemburg Mill Iron	85.00	100.00	75.00
Charleroi Mill Iron	90.00	105.00	80.00
Thomas Pig	105.00	120.00	90.00
No. 2 Bars, f.o.b. Belgian stations	185.00	205.00	180.00
No. 3 Bars, f.o.b. Belgian stations	190.00	210.00	185.00
No. 2 Bars, f.o.b. Antwerp	172.50	195.00	180.00
No. 3 Bars, f.o.b. Antwerp	177.50	200.00	185.00
Beams, Iron or Steel, at mill	180.00	200.00	180.00
Beams, Iron or Steel, f.o.b. Antwerp	175.00	185.00	180.00
Angles, f.o.b. Belgian stations	200.00	210.00	190.00
No. 2 Iron Plates, f.o.b. Antwerp	190.00	215.00	195.00
No. 3 Iron Plates, f.o.b. Antwerp	215.00	230.00	205.00
Homogeneous Iron Plates, f.o.b. Antwerp	235.00	250.00	230.00
No. 2 Plates, f.o.b. Belgian stations	195.00	210.00	200.00
No. 3 Plates, f.o.b. Belgian stations	220.00	235.00	210.00
Homogeneous Iron Plates, f.o.b. Belgian stations	240.00	255.00	240.00
Steel Plates, f.o.b. Belgian stations	220.00	235.00	225.00
Steel Plates, f.o.b. Antwerp	215.00	230.00	
Sheets, f.o.b. Belgian stations	230.00	245.00	225.00
Sheets, f.o.b. Antwerp	225.00	240.00	225
Steel Rails, f.o.b. Antwerp	150.00	160.00	125.00

From the above list it may be seen that the prices of certain products have fallen lower than last year at the same date. This is more especially the case with Bars, Beams and Plates. All the progress made since a year ago is lost and may be traced to the fact that in July, 1899, fuel sold at 13.50 francs, while to-day it stands at 25 francs, almost twice as much, and that Pig Iron in 1899 cost 10 francs less than it does to-day, and that la-

bor has advanced 30 to 40 per cent. The situation, therefore, at the present time is much worse than it was a year ago.

New York.

Office of *The Iron Age*, 232-238 William street, }
NEW YORK, August 1, 1900. }

Pig Iron.—A somewhat larger volume of business is being done. Sales of small lots are more numerous, and consumers seem to be calling for a slightly larger tonnage in such cases. Inquiries for round lots are also more frequent. Prices show no improvement, and in some cases our quotations are reported to have been shaded. The figures given, however, represent the condition of the market from the standpoint of the sellers of standard brands. Quotations are as follows at tidewater: Lehigh, Schuylkill and Virginia Irons, No. 1, \$17 to \$18; No. 2 X, \$16 to \$17; No. 2 Plain, \$15 to \$16; Gray Forge, \$14 to \$15. Tennessee and Alabama brands, No. 1 Foundry, \$18.50 to \$19; No. 2 Foundry, \$17.25 to \$17.75; No. 1 Soft, \$18.50 to \$19; No. 2 Soft, \$17.25 to \$17.75; No. 3 Foundry, \$16 to \$16.50; No. 4 Foundry, \$14.75 to \$15.25; Gray Forge, \$14.25 to \$14.75.

Steel Rails.—The only transaction in Standard Section Steel Rails reported is a sale of 1000 tons. It had been expected that quite a number of belated buyers would be in the market at this time of the year, but the requirements of the railroad companies appear to have either been thoroughly covered or are of such a character that they can be postponed until lower prices prevail. Manufacturers continue to quote at \$35, at mill in Eastern Pennsylvania. Track Fastenings are in almost as light demand as Rails. It is likely that prices could be shaded considerably if any respectable quantities were desired, but for the present Spikes continue to be held at 2.10c. to 2.20c.; Splice Bars, 2c. to 2.20c.; Square Track Bolts, 3c. to 3.10c.; Hexagonal Track Bolts, 3.10c. to 3.20c.

Cast Iron Pipe.—The demand for small lots is better, and the outlook is more encouraging. Bids will be opened at Boston on Friday for 950 tons. Prices are still quotable at \$27 to \$27.50 for small lots of 8-inch Pipe at tidewater, but for large lots these rates would be materially shaded.

Finished Iron and Steel.—Quite a good tonnage is being entered for bridge work, and some additional important business is now about to be placed. As before stated the bids on the approaches to the East River Bridge will be opened next week, involving about 18,000 tons of material, but other heavy business is also on the eve of being consummated. While the building trade is generally quiet in this vicinity, it is expected that a contract for the new building of the Connecticut Mutual Life Insurance Company will be let this week, covering 1000 to 1200 tons. Manufacturers are feeling much more hopeful than some time since, as specifications are beginning to come in more freely on old contracts, and the percentage of inquiries now resulting in actual business is steadily growing larger. The demand for Steel Plates is quite good, and the trade would be satisfactory if prices were not so low, owing to the sharp competition for business. Inquiries are still being received for good quantities for export. We quote as follows at tidewater: Beams, Channels and Zees, 2.05c. to 2.15c.; Angles, 1.95c. to 2.05c.; Tees, 2.10c. to 2.20c.; Bulb Angles and Deck Beams, 2.35c. to 2.45c.; Universal Mill Plates, 1.30c. to 1.40c. Sheared Steel Plates are 1.30c. to 1.40c. for Tank, 1.40c. to 1.50c. for Shell, 1.50c. to 1.70c. for Flange, 2.10c. to 2.30c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.35c. to 1.40c.; Common Bars, 1.30c. to 1.35c.; Soft Steel Bars, 1.20c. to 1.30c., and Hoops, 2.25c. to 2.35c., base, on dock.

Old Material.—Dealers report absolutely nothing doing in Old Material, and state that it appears impossible to effect sales at any price. Nominally, the quotations on Old Iron Rails are still \$12 to \$14 and on Old Steel Rails, \$11 to \$13. A great deal of tonnage in Old Material is steadily being offered, but the bids received are too low to be entertained. A large lot, consisting of about 800 tons of Heavy Steel Scrap, is one of the recent additions to the stock of Old Material being pressed for sale.

The new Russian cruiser "Viriag," built at the Cramp yards in Philadelphia, had her builders' trial off the New England coast last week, developing a maximum speed of 24.65 knots. A speed of 23 knots is called for by the contract with the Russian Government. That the "Viriag" attained a speed of 24.65 knots is taken as a promise of even a better showing on her speed trial later, because at no time was she under forced draft. Her engines developed 20,000 horse-power during the test.

Metal Market.

Office of *The Iron Age*, 232-238 William street, }
NEW YORK, August 1, 1900. }

Pig Tin.—At the beginning of the week under review an effort was made to sustain the spot quotation, but free arrivals and more freely made offerings brought the market down to a normal condition. To-day spot is obtainable at 32½c., while futures are neglected. London closed to-day £142 15s. for spot and £137 5s. for futures. The monthly statistics show unfavorably with an increase in the visible supplies of 1659 tons above the figures of a month ago. The American visible supply is now up to 5527 tons.

Copper.—Notwithstanding certain inflated reports to the contrary, we are informed on most reliable authority that the market is a quiet one and that the demand is very light. Prices have not changed, and are still quoted 16½c. for Lake, 16¾c. for Electrolytic and 16¾c. for casting stock. There are reliable reports of sales of Lake at 16.40c., and it is also said that quantities have been offered at 16.37½c. The London market to-day closed with £74 for spot and £74 2s. 6d. for futures, being a considerable advance for the speculative article. Strange to say, however, Best Selected Copper declined 10 shillings to £77 15s. This is believed to be an earmark of the manipulation of the speculative article. The exports for the month of July amounted to 10,661 tons, being the smallest for any month of this year. European Copper statistics for the last fortnight show an increase of stock of 2380 tons, and a decrease in floats of 1300 tons. The semiannual United States Copper statistics, as published by the New York Metal Exchange, and which we print below, show an increase in the shipments for the half year of 35,715 tons, but also a decrease in the home consumption of 19,467 tons. The position at present is an interesting one, and as puzzling as interesting. While considering the fact that the strength of the article has been in the heavy shipments to Europe, the decrease of consumption must not be lost sight of. The situation now depends upon the question as to whether Europe will continue to relieve us of our surplus. The decrease in exports for the month of July does not speak well in this respect, and it is said by influential parties in the trade that good quantities went into storehouses. The fact must also be considered, however, that the producers are sufficiently wealthy to take care of a considerable surplus.

Semiannual Statistics, in Tons of 2240 pounds.

SUPPLIES.			
For the six months ending June 30—	1900.	1899.	1898.
Domestic production.....	134,577	124,487	120,487
Importations	20,066	13,908	6,811
Total	154,643	138,395	127,298
SHIPMENTS.			
For the six months ending June 30—	1900.	1899.	1898.
To Europe.....	85,322	51,723	65,334
To British North America.....	386	220	.....
To Mexico.....	81	50	.....
Contents of sulphate of copper.....	3,829	1,910	1,090
Total	89,618	53,903	66,424
HOME CONSUMPTION.			
	1900.	1899.	1898.
Deducting shipments from supplies, there were apparently left for home consumption for the first six months, ending June 30.....	65,025	84,492	60,874

Pig Lead.—Another surprise was furnished by the American Smelting & Refining Company in the shape of a ¼c. advance in price. The price now quoted by them is 4.25c., New York, for lots of 50 tons and more. Although the trade have become quite accustomed to sensations from this quarter there was considerable comment regarding this latest move, owing to the fact that business was very limited before the advance was made. It is said that miscellaneous shipments from the West were offered at prices below those quoted by the combination. London has advanced to £18.

Spelter.—The market is quiet and has not changed since last week. Prices quoted are 4.25c. to 4.30c. Exports are good, but trade here is slow. London is unchanged at £19 10s.

Antimony.—Is unchanged. Hallett's is quoted 9½c. and Cookson's 10½c.

Nickel.—Refiners are said to be still in arrears in shipments and the metal holds most firmly. Prices are unchanged, small lots commanding from 55c. to 60c.

Quicksilver.—Wholesale lots of 100 flasks and more are quoted at \$51 per flask of 76½ lbs. London remains unchanged at £9 10s.

Tin Plate.—There is no change in the situation. Consumers are buying from hand to mouth, being supplied from stock. The American Tin Plate Company still quote \$4.84 per box of 100-lb. Cokes, New York delivery, or \$4.65 f.o.b. mill.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING AUGUST 1, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday
\$29,000,000	Am. Car & Foundry, Common...	845	.....	-15	-15	-15	.....	-15
29,000,000	Am. Car & F'y, Pref. (7% Non-Cu.)	260	-63	.....	.....	.....	.....	-63
19,000,000	Am. Steel Hoop, Common.....	2,520	-20 3/4	20 -21	.....	18 7/8 -19	-19	17 1/2 -19
14,000,000	Am. Steel Hoop, Pref. (7% Cu.)...	1,000	.....	-67	.....	66 7/8 -67	-66 7/8	.....
50,000,000	Am. S. & W., Common.....	21,976	34 1/2 -35 1/2	34 1/2 -35	-34 7/8	33 1/2 -34 1/2	32 1/2 -33 1/2	32 -32 7/8
40,000,000	Am. S. & W., Pref. (7% Cu.).....	1,046	73 1/2 -74 1/2	-73 1/2	-73 1/2	-73 1/2	-73 1/2	.....
28,000,000	Am. Tin Plate, Common, N. Y....	1,930	21 1/2 -23	.....	.....	-21 1/2	21 1/4 -21 1/4	22 -22 1/2
18,325,000	Am. Tin Plate, Pref., N. Y. (7% Cu.)	817	-79	78 3/4 -78 1/2	.....	-78	.....	-78
7,500,000	Bethlehem Iron.....	18	.....	-57	.....	.....	.....	.....
15,000,000	Beth. Steel, Par \$50, \$1 paid in....	660	.....	14 1/2 -15	.....	.....	-14 1/2	-14 1/2
7,974,550	Cambria Iron, Phila.....	4	.....	.....	-44	.....	.....	.....
16,000,000	Cambria Steel**.....	2,770	16 7/8 -17	-17	-17	16 3/4 -17	16 1/4 -16 1/4	16 3/8 -16 1/2
11,000,000	Col. Fuel and Iron.....	1,080	.....	-34	.....	32 1/2 -33 1/2	33 1/2 -33 1/2	.....
46,484,300	Federal Steel, Common.....	26,335	33 1/2 -34 1/2	34 -34 1/2	33 1/2 34 1/2	32 1/2 -33 1/2	31 1/2 -33	31 1/4 -32 1/4
53,253,500	Federal Steel, Pref. (6% Non-Cu.)	2,410	66 -66 1/2	65 1/2 -66	-65	65 -65 1/2	64 1/2 -65 1/2	-65
32,000,000	National Steel, Common, N. Y....	3,200	24 1/2 -25	24 1/2 -24 1/2	.....	23 1/2 -24 1/2	23 1/2 -24 1/2	23 1/2 -24
27,000,000	Nat'l Steel, Pref., N. Y. (7% Cu.)	1,430	84 -85	-83 1/2	-84	83 1/2 -84	.....	.....
40,000,000	National Stl. Tube, Common, N. Y.	1,470	-46	-46	-46	-44	.....	.....
40,000,000	National Stl. Tube, Pref., N. Y....	872	-90	-90	-89 1/2	.....	.....	-89 1/2
5,000,000	Penna., Common, Phila.....	100	.....	-57	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	1,250	-41 7/8	41 3/4 -42	.....	41 -41 1/2	-41	40 -40 1/2
12,500,000	Pressed Steel, Pref. (7% Non-Cu.)	630	-73 1/2	73 1/2 -73 1/2	.....	.....	-73 1/2	.....
27,352,000	Republic Iron & Steel, Common.....	2,920	.....	.....	-12	-10 3/4	.....	9 -10 1/2
20,852,000	Repub. Iron & Steel, Pref. (7% Cu.)	2,052	-54	53 1/2 -54	.....	.....	-53	49 -51 1/4
7,500,000	Sloss-Sheffield S. & I., Common..	.....	.....	.....	.....	.....	.....	.....
6,700,000	Sloss-Sheffield S. & I., Pref.....	720	.....	64 -64 1/2	65 -65 1/2	.....	.....	-65
20,000,000	Tennessee Coal and Iron.....	12,315	71 -71 1/2	70 1/2 -71 1/2	71 -71 1/2	68 -70	67 1/4 -69	68 1/4 -69 1/2
1,500,000	Warwick Iron & Steel (par \$10)..	1,050	-8 1/2	-8 1/4	8 -8 1/4	-8	-8	.....

* Par \$50. ** \$9 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

Bonded indebtedness: Am. S. & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,822,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; National Tube, none; Tennessee C. I. & R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%, Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899.

Iron and Industrial Stocks.

The steel stocks were under pressure during the past week and prices receded materially. Transactions were not on so large a scale as during the previous week. Disappointment over the outcome of the Chicago conference of iron and steel manufacturers was the leading cause of the decline.

	Bid.	Asked.
American Bicycle Company, common.....	6 1/4	7
American Bicycle Company, preferred.....	32	35
American Bicycle Company, bonds.....	70	83
E. W. Bliss, common.....	.....	137 1/2
E. W. Bliss, preferred.....	125	.....
Cramps' Shipyard stock.....	75	80
Diamond State Steel.....	3 1/2	3 3/4
International Silver, common.....	2	2 1/2
International Pump, common.....	20	20 1/2
International Pump, preferred.....	66	67
Otis Elevator, common.....	28 1/2	29 1/2
Otis Elevator, preferred.....	86 1/2	88
Pratt & Whitney, common.....	3 1/2	5
Pratt & Whitney, preferred.....	50	55
U. S. Projectile.....	95	100
Tidewater Steel.....	8 1/4	8 1/2
U. S. Cast Iron Pipe Company, common.....	4	4 1/2
U. S. Cast Iron Pipe Company, preferred.....	25	34
H. R. Worthington, preferred.....	.....	110
Empire Steel, common.....	6	10
Empire Steel, preferred.....	30	36

At a special meeting of the stockholders of the Danville Bessemer Company, held at the office in Camden, N. J., on Tuesday, a resolution was adopted giving the directors full authority to sell in whole or in part the property of the company. After the meeting it was said that the directors would probably dispose of the steel plant at Danville. It is understood that the stockholders have enough assets to meet all liabilities and to pay them for all the money put into the concern. The stock sold on Tuesday for 1 1/2. Last year it sold up to 6.

W. C. DeArmond, secretary of the Pressed Steel Car Company of Pittsburgh, referring recently to operations of his company, said: "Everything is working splendidly and we are prosperous. The month of June was the biggest one in the history of the company, the business billed out having footed up between \$2,000,000 and \$2,500,000 gross sales. To-day we took orders for 800 cars from the Chicago & Alton and Union Pacific Railroad Companies."

The directors of the Westinghouse Electric & Mfg. Company have declared a quarterly dividend of 1 1/2 per cent. on the assenting stock, payable August 15. The dividend is the same as paid May 15 and is 1/4 per cent. more than the initial dividend paid February 20 this year.

The Standard Coupler Company have declared the semiannual dividend of 4 per cent., payable July 30.

It is reported that the net earnings of the Cambria Steel Company for June amounted to \$300,000.

The annual statement of the American Shipbuilding Company shows the net earnings to have been \$1,100,000. A dividend of 7 per cent. on preferred stock took \$532,000 of these earnings, leaving a surplus of \$568,665.

which would be more than enough to pay another 7 per cent. dividend. The capital issued by the company is \$7,900,000 of preferred and \$7,600,000 of common stock.

The Jefferson & Clearfield Coal & Iron Company have declared a dividend of 2 1/2 per cent. on the preferred stock and 2 per cent. on the common stock, payable August 15.

The directors of the Consolidated Car Heating Company have declared a semiannual dividend of 1 1/2 per cent. and 3 1/2 extra, payable August 15.

An expert is now working on the books of the various companies constituting the Crucible Steel Company of America, and when his report is completed application will be made to list the securities on the New York Stock Exchange. The following rights, privileges and conditions are attached to the shares of the new company: The common stock shall be subordinate to the rights of the preferred stock, except that both the preferred and common stock shall have equal voting powers. The corporation shall not be at liberty, without the consent in writing first obtained of the holders of two-thirds of preferred stock issued and outstanding, to create or issue any other or further shares in any respect *pari passu* with or in priority to the aforesaid issue of \$25,000,000 of preference shares, nor to create any charge, except as hereinafter provided, upon the net profits of the corporation which shall not be subordinate to the rights of the preference shares, nor to reserve a surplus fund which shall not be chargeable with the payment of the accrued dividends upon the preference shares.

The Sloss-Sheffield Steel & Iron Company have made a report for the six months ending May 31, which is briefly as follows: Net earnings, \$741,182; interest, \$101,287; net income, \$639,893; dividends, \$234,500; surplus, \$404,395.

The Thomas Iron Company declared their semiannual dividend, payable August 1, of 4 per cent., with 4 per cent. extra. This makes 16 per cent. for the year.

A press dispatch from Lebanon, Pa., states that on Tuesday the workmen employed at the local works of the American Iron & Steel Mfg. Company went on strike in consequence of posted notices stating that from August 1 the wages of puddlers would be reduced from \$4 to \$3 per ton.

The Journal of the Franklin Institute for August contains the report of the Institute Committee on Science and the Arts, investigating the invention in gear cutting of E. R. Fellows of Springfield, Vt. The report states that the committee believes that the machine and cutter invented by Mr. Fellows mark a distinct advance in the art of gear cutting which should be recognized. The Franklin Institute therefore recommends the award of the John Scott Legacy Premium and Medal to Edwin R. Fellows of Springfield, Vt., for his "Machine and Cutter for Generating Gear Teeth."

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street,
New York, August 1, 1900.

At the close of a most trying month the trade finds itself possessed of a feeling of hopefulness more radiant than the fondest anticipations permitted a few weeks ago. Passing through the summer solstice under such conditions lends encouragement to the situation, which is bound to be felt and which may be looked to as a forecast of an early period of fall activity. The story of the lack of confidence in the situation displayed on all sides by consumers for months past is one that has been told and retold. In consequence of this condition it was most natural for consumers to hold back their purchasing as long as possible. Manufacturers have been practically bare of stocks for a long period, and rather than engage ahead in the purchase of raw materials they were even wont to advise customers to hold back, assuring them of the belief that they would see lower prices. Engineers advised their clients to wait, and on all sides there was a general holding back of business. The dullness which resulted was pointed out as owing to the fictitiously high prices, and the whole situation was contingent on the readjustment of price scales. For the last three months we have seen prices gradually decline, and the adjustment of affairs was effected in a most orderly manner. Now that normal condition have been about restored there is a feeling of growing confidence in greater activity. A multitude of enterprises will from present indications soon be presented that have been kept dormant since spring. The inquiries of the last week bear signs of the coming activity, and that stage where clients felt it too hazardous to enter the market is being overcome. That consumers feel that in many instances prices have about touched bottom is evidenced by the number of parties who have resurrected propositions which have fallen out of sight months past, and have made offers based on present prices of raw materials. In almost all instances such proposals have met with the acceptance of the merchants to whom they were made. This has brought about a new stir of activity which has shown itself already, and among the most conservative of machinery merchants there are a number who assert that a movement has begun which will, unless the unexpected happens, bring about a great scramble for deliveries.

The meeting of the directors and stockholders of the Pratt & Whitney Company, held at Hartford last Wednesday for the purpose of acting on the proposition of the Niles-Bement-Pond Company for reorganization of the concern, did not result in a final settlement of the matter as was expected. There was scarcely any opposition to the scheme, however, and it is thought that arrangements will be completed on August 16, when the meeting of last week will be continued. Only 16,910 shares, including 10,412 preferred and 6,498 common, were represented out of the total capital stock of 27,500 shares. The amount represented was scarcely sufficient to transact the business proposed. Consequently no motion or resolution providing for the acceptance of the proposition was submitted to the meeting. After the adjournment of the stockholders' meeting the directors met and decided to make further efforts to secure a full representation of the capital stock at the adjourned meeting. William W. Hyde of the Hartford firm of Gross, Hyde & Shipman, is the attorney for the Pratt & Whitney Company, and Cuyler, Morgan & Co. of New York are the financial agents. Mr. Cuyler is chairman of the Board of Directors of the Pratt & Whitney Company.

Charles Oliver, the chief railway commissioner of the New South Wales Government Railways and Tramways, who has been in this country during the last six weeks, will return to his home next Saturday. Mr. Oliver has been investigating American traction facilities, and has received bids for about \$1,000,000 worth of additional electric generation equipment. The extension of the power house has been made necessary by the conversion of the steam and cable tramways in Sydney and vicinity into an electric system. The present power house of the Sydney City and Suburban Tramways is equipped with four 850 k.w. General Electric generators. Owing to the increase of traffic it has been found necessary to add three 1500 k.w. generators. At present horizontal engines of the E. P. Allis build are running, but it has been decided to add several of the vertical type. The engines, boilers and generators which are to be added will cost approximately \$850,000. It is possible that Mr. Oliver will receive cable advices from New South Wales permitting him to close the contracts, but up to this writing the matter has not been closed. The road is 70 miles in length. All apparatus will be purchased in this country, with the exception of the car bodies, which will be built in New South Wales. At present there are about 25 miles of the road in operation. About two years and a half will be required in finishing the road, and in the meantime there will be numerous orders placed in this country for trolley poles, wire and like accessories. Mr.

Oliver, who was born in Australia, rose from the ranks to the highest position of trust and confidence in railroad circles in New South Wales. He has recently been appointed without a dissenting voice by Parliament for another term of seven years. He has two assistant commissioners, Messrs. Fehon and Kircaldie.

A few weeks ago announcement was made in the columns of *The Iron Age* of the consolidation of the New York Air Compressor Company with the Franklin Air Compressor Company. The details of this transaction have just come to our notice. Under the new arrangement both companies will continue their existence as heretofore, with the exception that one will be exclusively a sales company and the other purely a manufacturing concern. The New York Air Compressor Company will cease manufacturing entirely and will take the entire output of the Franklin Company for a period of 25 years. The Franklin concern will, on the other hand, be solely manufacturers, and all business will be transacted through the New York Company. It will be recalled that the New York Air Compressor Company have recently equipped an excellent plant at Arlington, N. J. The equipment of this plant will be removed to the factories at Franklin, Pa. This will be accomplished by next November. It is stated in this connection that the Arlington plant will be sold by the New York Company when stripped of the machinery. The Franklin shops will be equipped to a capacity four times greater than that of the Arlington shop. All of the large tools have been purchased, and the Franklin Company will shortly be in the market for the smaller sizes of tools. Samuel G. Allen, the secretary of the company, and J. S. Coffin, the assistant to the president, were in New York last week and received bids on a 400 horse-power Corliss engine and three 200 horse-power water tube boilers. The orders have not been placed as yet. The company have received so many orders that it has been found necessary to have the compressors built in outside shops. They now have a number of orders on their books which they cannot turn out with their present facilities, and they are looking for suitable shops which are able to build the machines. The officers of the Franklin Air Compressor Company are Charles Miller, president; J. W. Duntley, vice-president; Samuel G. Allen, secretary. The officers of the New York Air Compressor Company are J. W. Duntley, president; Alexander Mackey, vice-president, and William P. Pressinger, secretary and treasurer.

The New York Air Compressor Company have received an additional order for a large duplex compressor from the New York Central Railroad. It is to be installed in the Grand Central Station for car cleaning purposes.

The Prentiss Tool & Supply Company are said to have just closed a deal with a light hardware manufacturer in New England, which involved a good number of Acme automatic screw machines.

The Story Motor Company, who are moving their plant from Trenton, N. J., to Harrison, N. J., are said to be in the market for a number of machine tools. The company build a special motor used in connection with air brakes on street cars.

Specifications for a list of machine tools which are to be installed in the meter department of the H. R. Worthington plant of the International Steam Pump Company are now going the rounds. Among the list are five large special millers and borers. The work is in charge of Mr. Ball. President Dunn of the International Steam Pump Company stated that they are also buying miscellaneous tools to be added to their various plants.

The E. B. Eddy Company, manufacturers of matches, pulp and paper, whose works at Hull, Quebec, were destroyed by fire about two months ago, have been purchasing material in this market for re-equipping their works. They have purchased about \$150,000 worth of machinery, tools, &c., and it is said that they will require about \$50,000 worth of additional machinery.

It is reported that William Goodwin of 268 Calle Reconquista, Buenos Ayres, Argentina, will shortly be in the market for all the machinery and material required in the building of a grain elevator. Mr. Goodwin recently received a Government concession, enabling him to import all of the material into Argentina free of duty. The work will cost \$700,000 in gold.

All of the bids which were received on July 19 for the completion of the Hall of Records Building have been returned unopened by the Board of Estimate and Apportionment. The bids were received and specifications issued by John R. Thomas of 160 Broadway. It will be recalled that the specifications called for the electric equipment, steam power, heating and ventilating apparatus, plumbing and draining systems, elevator equipment, ornamental metal work, hardware, &c. No date has been set for receiving new bids.

It is reported in the street that equipment is required by the Chattanooga Steel Roofing Company of Chat-

tanooga, Tenn., for fitting out a large addition which they are building to their plant.

A large order for pneumatic tools has been placed with the Chicago Pneumatic Tool Company by the General Electric Company. The latter concern have also been buying considerable miscellaneous machine tools.

Plans and specifications are being prepared by Herman Steinman, consulting engineer and architect, of 29 Broadway, for a brewery which is to be erected at Tokio by the Sapporo Brewery Company of Sapporo, Hokkaido, Japan. It is expected that the specifications will be out and bids received for the equipment some time during this month. The brewery, which will be the first to be erected in Tokio, will have a capacity of 75,000 barrels of lager, and it is estimated that about \$175,000 will be expended in its equipment. The entire plant will cost upward of \$300,000. All machinery which cannot be purchased in Japan will be secured in this country. It will be so constructed as to withstand the shock of the earthquake. Mr. Steinman is also preparing plans for the construction of a malt house for a large brewing company of Calais, France. It will be built according to the Galland system and will necessitate the purchase of about \$50,000 worth of American equipment. Previous mention has been made in this column of the fact that Mr. Steinman was placing contracts for the construction of a brewery at Cape Town for the United South African Breweries Company, Limited, of London. We are now informed that the bulk of these contracts have been placed. Milliken Brothers of 11 Broadway have secured the contract for supplying the structural steel and cast iron. The contract amounts to about 800 tons and is valued at about \$71,500. The Case Refrigerating Company of Buffalo, N. Y., were awarded contracts for the refrigerating machinery and ice making plant, amounting to about \$21,000. The ice plant will be capable of producing 105 tons per day. The boiler plant will be furnished by the Bigelow Company of 25 Cortlandt street and New Haven, Conn. It will consist of two 200 horse-power boilers valued at \$5800. The Roebling Construction Company of this city will furnish the fire proof flooring, aggregating in value \$6800. The contract for the brewing machinery was given to the Pfaunder Vacuum Fermentation Company of Detroit, Mich. This equipment is valued at about \$150,000, and will have a capacity of 100,000 barrels of ale, 75,000 barrels of lager and 25,000 barrels of porter. The plant will be in operation within a year. Other machinery and supplies are still to be purchased.

Bids have been readvertised for by the Board of Water Commissioners of Detroit, Mich., for one or two pumping engines of 25,000,000 gallons capacity each. J. W. McGrath is president of the board. Following are the bids which were received for these engines on July 11 and rejected: P. H. & F. M. Roots Company, Comersville, Ind., one engine \$110,050, two engines \$190,850; Dickson Mfg. Company, Scranton, Pa., one engine \$124,500, two engines \$246,000; Camden Iron Works, Camden, N. J., one \$137,500, two \$269,000; E. P. Allis Company, Milwaukee, Wis., one \$164,000, two \$325,000; Holly Mfg. Company, Lockport, N. Y., one \$175,000, two \$350,000; Detroit Shipbuilding Company, Detroit, Mich., one \$196,000, two \$286,000; S. F. Hodge & Co., Detroit, Mich., one \$199,000, two \$398,000.

A shipment of eight cars, the first installment on an order for 30, has just been made to the Honolulu Rapid Transit Street Railway Company of Honolulu, H. I., by C. Roehr & Sons, whose works are located at Bucyrus, Ohio.

A contract has been received by the Wheeler Condenser & Engineering Company of 120 Liberty street for a complete condenser plant which is to be installed at the Lisbon power station of the Portuguese Tramway Company. Contracts were also received by this company for the condensing sets to be placed in the stations of the Belfast & St. Helena Corporation and the Reading Electric Supply Company, and for the cooling tower and condensing plant required at the electric light station at Bromley, England.

One of the largest shipments of machinery ever sent abroad from this country was loaded this week on the British steamer "Hillglen" at New York, for transportation to Vladivostok. It is a complete plant for the boring of a tunnel 6600 feet long for the Chinese Eastern Railroad. The machinery, which is valued at \$125,000 and weighs over 2000 tons, is shipped by the Ingersoll-Sergeant Rock Drill Company of Easton, Pa.

Bids were opened on July 20 by the supervising architect for the high pressure and exhaust system, water and drain pipe, &c., for the United States Emigrant Station, Ellis Island, N. Y., as follows: Gaylord & Elitapenc, Binghamton, N. Y., \$17,585; G. A. Suter & Co., New York City, \$18,400; W. T. Hiscock & Co., New York City, \$18,400; Ed. Joy, Syracuse, N. Y., \$18,450; Westinghouse, Church, Kerr & Co., \$18,808; Gillis & Geoghagan, New York City, \$21,368; Edward P. Bates, Albany, N. Y., \$30,439.

Bridge Commissioner John L. Shea of New York received two bids for the Grand street bridge which is to span Newtown Creek, Brooklyn, N. Y. The lowest was submitted by Bernard Rolf, 39 Cortlandt street, New York. It named \$173,379.90. The American Bridge Company bid \$195,710.30. Mr. Rolf received the contract.

Projectile and Gun Carriage Bids.

At the office of the Chief of Ordnance, United States Army, the following bids for steel and cast iron projectiles were opened last week:

Steel Projectiles.

Item 1, 400 6-inch A. P. shot; 2, 1000 6-inch A. P. shell; 3, 1000 10-inch A. P. shell; 4, 600 12-inch A. P. shell; 5, 1000 12-inch D. P. shell, weighing 1000 pounds; 6, 600 12-inch torpedo shell, weighing 1000 pounds.

United States Projectile Company, Brooklyn, N. Y.—Item 1, \$24.40 each, first delivery in 60 days and 50 per week thereafter; 2, \$14.75 each, 100 per week after 30 days; 3, \$78.50 each, 25 per week after 90 days.

Carpenter Steel Company, Reading, Pa.—Item 1, \$23; 3, \$85; 4, \$138; 5, \$142; first lot in 45 days and one lot every 30 days thereafter.

Midvale Steel Company, Philadelphia, Pa.—Item 1, \$22.50, delivery in 80 days; 2, \$22.50 each, first lot in 50 days and one lot every 30 days thereafter; 3, \$69; 4, \$83.98; 5, \$83.98; 6, \$86; will deliver the 12-inch A. P. shell or the equivalent in weight of any other caliber, first lot in 70 days and one lot every 30 days thereafter.

Benjamin Atha & Illingworth Company, Newark, N. J.—Item 1, \$28; 2, \$21; 3, \$80; 4, \$105; 5, \$160; first lot in 60 days and one lot every 30 days thereafter.

Isaac Johnson & Co., Spuyten Duyvil, N. Y.—Item 1, \$90; 25 per week after 90 days.

Firth Sterling Steel Company, Ambler, Pa.—Item 1, \$32; 3, \$115; 4, \$200; first lot in 60 days and one lot every 30 days thereafter.

Taylor Iron & Steel Company, High Bridge, N. J.—Item 1, \$17; time, 21 weeks; 2, \$13.45, 400 shells in 18 weeks, 400 in 25 weeks and 200 in 28 weeks; 3, \$69.85, 250 in 16 weeks, 250 in 23 weeks, 250 in 30 weeks and 250 in 35 weeks; 4, \$125.85, 200 in 20 weeks, 200 in 28 weeks and 200 in 33 weeks; 6, \$68.80, 200 in 36 weeks, 200 in 29 weeks and 200 in 42 weeks.

Cast Iron Projectiles.

Item 1, 200 8-inch shot; 2, 200 10-inch shot; 3, 200 12-inch shot; 4, 200 12-inch mortar shell, weighing 800 pounds.

Cincinnati Shaper Company, Cincinnati, Ohio—Item 1, \$43.

Petersburg Iron Works Company, Petersburg, Va.—Item 1, \$8.50; 2, \$13.50; 3, \$20.50; 4, \$24.50; will deliver 400 shell in seven weeks and 400 six weeks thereafter.

North Penn Iron Company, Philadelphia, Pa.—Item 1, \$21; 2, \$32.81; 3, \$50.95; first lot in 60 days and 25 per week thereafter.

Payne Engineering Company, Elmira, N. Y.—Item 1, \$15.52; 2, \$26.56; 3, \$43.36; 4, \$44.48; delivery in four months.

Rome Locomotive & Machine Works, Rome, N. Y.—Item 1, \$11; time, four months; 2, \$16; time, four months; 3, \$27; time, five months; 4, \$27; time, five months. If awarded two or more lots, will deliver the whole in eight months.

J. B. & J. M. Cornell, West Point Foundry, West Point, N. Y.—Item 1, \$10.25; 2, \$14.98; 3, \$21.94; 4, \$29.44; first delivery in eight weeks and ten per day thereafter.

Tredegar Iron Works, Richmond, Va.—Item 1, \$8.70; 2, \$14.50; 3, \$24; 4, \$26; will deliver one-quarter of each lot on each of the following dates: September 30, October 30, November 30 and December 30.

Midvale Steel Company, Philadelphia, Pa.—For cast steel projectiles, item 1, \$15; 2, \$28.75; 3, \$50; 4, \$51; deliveries—item 1, 65 days; 2, 75 days; 3, 85 days; 4, 90 days.

Gun Carriages.

Bids for gun carriages were opened at the office of the Chief of Ordnance, United States Army, last week. They were as follows:

Midvale Steel Company, Philadelphia, Pa.—Four 10-inch carriages, \$16,990.24; will deliver first carriage in 162 days and one every 67 days thereafter; eight 12-inch carriages, \$31,980 each; first in 150 days and one every 31 days thereafter.

Morgan Engineering Company, Alliance, Ohio—Eight 12-inch carriages, \$33,985 each; first in 6 months, second in 7 months, third in 8 months, fourth in 9 months, fifth in 10 months, sixth in 11 months, and seventh and eighth in 12 months.

Bethlehem Steel Company, South Bethlehem, Pa.—Four 10-inch carriages, \$19,000; first in seven months and one every four weeks thereafter; eight 12-inch carriages, \$39,000; first in eight months and one every six weeks thereafter.

HARDWARE.

Condition of Trade.

WITH the progress of the season there is more business doing and among other features of the market it is noticeable that the jobbers are buying somewhat more freely. Their orders are for the most part to sort up stocks, which are not nearly as heavy as a few months ago, and it is recognized as desirable to get them in good shape for fall trade. The merchants are, however, buying very carefully and conservatively, and their orders are for such quantities as they are pretty sure to dispose of readily and soon. The retail merchants are pursuing a similar policy, which is regarded as a wise one, in view of the downward tone of the market in the raw material, and the fact that the effect of the decline in Iron has not as yet been fully felt in many lines of manufactured product, as many manufacturers are working on high priced material and others are holding the market as firmly as possible, taking the view that it will be time enough to revise prices when the Iron market assumes a more settled condition and prices reach a stable basis. The traveling representatives of both manufacturers and jobbers are busy on the road and do much by their efforts to stimulate trade. Their reports are generally rather encouraging and indicate the prospect of at least a fair fall business. The rapid growth of the export trade is one of the prominent features of the situation, and the great quantity of products thus going abroad does much to relieve the home market in times like these when the demand relaxes. It is evident, too, that the foreign trade is deserving the best attention of manufacturers and must be cultivated not merely for the disposal of surplus goods, as has sometimes been the case, but as a permanent business which is to be taken care of with as much attention as the home markets receive. Its rapid development indicates its importance and the promise it gives of still further great increase in volume.

Chicago.

(By Telegraph.)

The marked rise in canned meats, due to demand for military consumption, is remotely improving the purchasing powers of the Western farmers and adding one more item to their products, the prices of which are eminently satisfactory to the seller and producer. The farmers in the West and Northwest are now busy with their crops, and the spring is said to be from three to four weeks in advance of last year. The grain raisers are rushing product to market to obtain advantage of current prices. This helps the Hardware trade and affords partial explanation for the somewhat phenomenally brisk buying upon the declining market. There is unanimity of report upon the satisfactory state of trade for the season. July was a good month and August promises equally well. There are the beginnings of fall trade visible, but it is not notable. When it occurs the sellers usually take the initiative in order to obtain room for other goods or for some other special reason. Nowhere is there evidence of speculative buying. The demand is of general character, and those seasonable products are few that are not benefited by the current trade. Heavy Hardware continues in excel-

lent shape, the changes observable being toward even greater activity. Among small shops there is now some disposition to buy for future needs.

St. Louis.

Conditions are somewhat improved. Jobbers are in receipt of encouraging orders in which those coming by mail still figure extensively. It is apparent that stocks in dealers' hands are sensibly smaller, and gathering this information from expressions of the trade as well as reports of travelers, jobbers expect the volume of fall business to reach large proportions. With the exception of North and South Dakota and parts of Minnesota the outlook in all States is said to be quite satisfactory. Conditions in Southern States are by no means discouraging. It is interesting to note that opening stocks are still being arranged for. The buying of fall goods continues later than usual, but jobbers say they are fairly well prepared to fill belated orders for Stove Pipe, Coal Hods, Stove Boards and Air Tight Heaters. Lanterns are in more active demand, although at this time last year the greater part of supply was sold out. Campaign clubs are being enthusiastically organized in some sections, and a corresponding demand aroused for torches and supplies. In other localities but little interest has thus far been manifested. The Heavy Hardware trade say that the demand for wagon goods appears to be improving. Orders are fully as numerous and seem to be growing in size. The month of July some say will show sales as large as during any corresponding month when markets were in different conditions.

Philadelphia.

SUPPLER HARDWARE COMPANY.—Trade, which had been somewhat sluggish the last two weeks in June and the first two weeks in July, shows some improvement since the middle of July, and especially so during the past week. There has been no appreciable change in prices, nor do we feel that jobbers have any large overstock in the aggregate which would induce them to sacrifice goods below manufacturers' prices. It is always the case that heavy purchasing such as existed during 1899 leaves some lines of goods in the hands of jobbers a little larger than they might possibly be under normal conditions, but other lines of goods are possibly below the normal conditions of stock; so as a whole we feel that no jobbers are hampered by overstock in conducting their business upon legitimate methods.

There is no disposition to buy on speculation, but there is a disposition for jobbers to keep their stocks intact and thus be able to supply the quick demands of the trade. We think there is a little disposition on the part of the retail merchants to starve their stocks, but that we attribute largely to the condition of the weather of the past few weeks, which has not been such as would inspire one to vigorously make efforts for trade. It has also become customary in the last few years for persons who engage in trade to take vacations and thus absent themselves for a couple of weeks during the months of July and August.

Everything indicates prosperity and activity in trade.

Boston.

BIGELOW & DOWSE COMPANY.—This is the vacation season when the reduced force is kept busy, and little effort is made to count sales. The past month will show a normal amount of orders, and generally quite equal to that of former years.

The retail dealers generally are buying carefully, and their orders are for small quantities and are bought of the jobbers. This extra trade serves to keep up the

jobber's sales and helps him to reduce his stock, and while his factory stock orders are now light they must naturally increase as the stocks are depleted.

The manufacturers are pursuing a wise course in holding their prices. Dealers are gaining confidence slowly, and the belief is that there will be no general break in prices before the new year except on Heavy Hardware and goods where the labor cost is not an important factor. Generally, manufacturers' prices are being maintained by the trade.

It looks now as if affairs were shaping themselves for a large and profitable business the coming fall.

Baltimore.

CARLIN & FULTON.—During the last few weeks orders for prompt shipment have been confined mostly to staples or to goods wanted for immediate consumption.

Refrigerators, Ice Cream Freezers, Wire Screens and Doors and goods strictly seasonable have been in active demand, while the tendency as to stock orders has been to postpone placing them to as late a date as possible. The reason of this has been a general expectation by the average buyer for lower prices on everything regardless as to whether the goods had advanced or not.

We are glad to report that as the fall season approaches a better feeling is to be noticed, and it is believed that while business may be a little later than last year, still it will be normal in volume and more confined to the proper seasons for goods instead of being done so far ahead as was the case last year, when every one was anticipating still further advances and anxious to get in early.

Since the reduction in the Nail and Wire market of last April there has been no change in the value of those commodities, and inasmuch as the reduction was made, it was stated, for the purpose of moving the accumulated stock, we presume that since that time the volume of business has been satisfactory and the desired object obtained.

Most of the changes which were anticipated have occurred, and it is hardly likely that right on the eve of the fall business further reductions are probable, and we therefore would suggest to our friends that it is not well to be without goods with which to transact business.

The man who buys no goods, of course, will suffer nothing from a decline, but he will very probably be out of the market and his trade will have disappeared while he is waiting for a change in price which may not occur, at least until another season shall have passed.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—There have been no special changes in conditions of trade since our last report. The weather has continued very favorable for the maturing of the crops over much territory, and harvesting has been progressing in large sections. Upon the whole there has been decided improvement in nearly all crops during the past two weeks, except in parts of the Dakotas, and the situation is greatly improved, as compared with that of July 1.

The outlook now is that about the average amount of goods will be sold by the wholesale houses here, though trade will not be so nearly equally distributed as usual. The volume of trade for the month is quite satisfactory, and prices have shown generally a greater steadiness than expected. Collections have given no cause for complaint.

Cleveland.

THE W. BINGHAM COMPANY.—Under all the circumstances trade for July has kept up remarkably well. Orders although very small are numerous and frequent, so that their total compares very favorably with July of a year ago. The continued lowering of price on raw material is retarding trade to a very great extent, and those manufacturers who have been obliged to buy material at

the high prices and who are consequently keeping the price of their goods up, in hopes of getting out without loss, might as well take their medicine at once and come down with the market, or they will otherwise be obliged to hold their stocks and thus incur further loss in accumulating interest charges.

How long would a jobber stay in business who asked a profit or even cost on goods which had declined in price away below what he paid for them? Why should not a manufacturer be subject to the same rule?

They should, and will have to, if they expect to hold their trade.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—We have been undergoing a hot spell during the past ten days, so that between hot weather and pests our crop prospects are not as bright as heretofore reported. The reports that come from harvest fields, where grain has been thrashed, are all of one tenor, yield is not up to expectations. Our lumber interests, too, have suffered from the lack of demand during the past 30 days, and as wool is not moving at all we must admit that the future does not look as rosy hued as when we wrote you last.

During the past week we have bought some staple lines with greater freedom and easier conscience than we have in a year past. The pendulum is swiftly swinging back to its starting point, and the sooner it gets there the better for all of us. In past booms it has been a question of years of declining market, where now it looks like months. When we get another drop of \$1 in Nails and Wire we will have the confidence to back our judgment with purchases again.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—Business throughout this section of the country still holds up to a satisfactory standard of activity, and shows already a handsome gain over the corresponding period of last year.

The splendid crops of the past and the very favorable outlook for the coming corn crop promise to develop a healthy volume of business during the fall months. The indications all point to a continuance of good trade, and although the general policy is based upon conservatism, still there is no apparent lack of confidence in the business future. Public and private enterprises are being pushed forward to completion rapidly and without any interruption. Labor of all kinds is well employed and at remunerative figures.

At no time in the history of this section have the evidences of substantial growth and prosperity been more apparent than they are to-day.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The Hardware jobbers in this city are receiving about the usual amount of trade for July. The wheat crop in this section has been threshed, and quality and quantity are much better than the farmers anticipated. We have prospects of a good corn crop and a fair cotton crop. In fact, the only obstacle in the way of a good business and prosperous times is a decline in market. If the manufacturers would exercise a little firmness and fix their prices at some figure that can be maintained, the jobbers and retailers will soon accept the situation and business will move along smoothly. A strong legitimate demand for goods is not wanting, but merchants will not buy freely on a declining market.

Notes on Prices.

Wire Nails.—The condition of the Wire Nail market is unchanged. Trade is referred to as being up to anticipations in view of the general condition of the market and the conservatism with which the trade are buying. Some members of the trade anticipate lower prices, but this feeling is not based upon advices from the manu-

facturers. Prices continue without change as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

New York.—Distribution of Wire Nails continues moderate. Purchasers are confining themselves to frequent orders for small quantities. This policy is pursued by some, even at a charge per keg for cartage from store. Lower prices are ruling on small lots from store. Quotations are as follows:

To retailers, carloads on dock.....	\$2.48
Small lots from store.....	\$2.55 to \$2.60

Chicago, by Telegraph.—Trade from mill during the last week of July was the largest of the month. August is starting out with continued activity. While there is nothing approaching the activity of early spring, the business keeps up remarkably well for midsummer. Prices are unchanged at \$2.43 for carloads and \$2.50 for small lots from store.

St. Louis.—Individual orders are for small quantities, but make a seasonably good aggregate tonnage; \$2.45, base, is the carload price to retailers; \$2.55, base, in less than carloads.

Pittsburgh.—Considering that this is the duller season of the year, the present demand for Wire Nails is fairly satisfactory. It is mostly, however, for small lots. Buyers evidently are not apprehensive that there will be an advance in Nails in the near future. There is no change in prices, and we quote as follows, f.o.b. Pittsburgh; terms 60 days or 2 per cent. off in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

Cut Nails.—At a meeting of Cut Nail manufacturers held on July 26 former prices were reaffirmed. Orders continue to be largely for less than carload lots. The market is not regarded as an especially strong one, and some irregularity in prices is reported. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days:

Carload lots.....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

New York.—The local business in Cut Nails for July is regarded as satisfactory under present conditions, while it is only moderate in volume. Quotations are as follows:

To jobbers in carload lots on dock.....	\$2.13
To jobbers in less than carload lots on dock.....	2.18
To retailers in less than carload lots on dock.....	2.31
Small lots from store.....	\$2.25 to 2.30

Chicago, by Telegraph.—Sellers who are holding closely to circular do not seem to be doing a driving trade in Cut Nails, there being some evidence of irregularity in prices. From store demand is normal at \$2.25.

St. Louis.—No change in the situation is had thus far. Sales seldom involve heavy tonnage, and a decline would not seriously affect the small stocks which are kept on hand. Price is \$2.30, base, from store.

Pittsburgh.—There is nothing of special interest to note. Buyers of Cut Nails are placing orders mostly for less than carload lots, not being willing to carry stocks. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days:

Carload lots.....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

Barb Wire.—Conditions in the Barb Wire market are unchanged. The demand is not large, but indications are favorable for an increase in the fall. While prices are maintained the tone of the market is not very strong. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.50
To jobbers in carload lots, Galvanized.....	2.80
To jobbers in less than carload lots, Painted.....	2.55
To jobbers in less than carload lots, Galvanized.....	2.85
To retailers in carload lots, Painted.....	2.60
To retailers in carload lots, Galvanized.....	2.90
To retailers in less than carload lots, Painted.....	2.70
To retailers in less than carload lots, Galvanized.....	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

Chicago, by Telegraph.—In the Southwest there is little call for Barb Wire at present, but in the West and Northwest demand is relatively good. The aggregate volume is large for the season. Prices continue without change. Quotations for small lots, Chicago delivery, are \$2.40 for Plain Annealed, \$2.75 for Painted Barb and \$3.10 for Galvanized Barb Wire.

St. Louis.—Movement is all that can be expected at this season. No improved activity is noted. Price in carload lots to retailers for Painted is \$2.75; less than carloads, \$2.85; 30 cents advance is asked for Galvanized.

Pittsburgh.—Trade is very light, and is altogether for small lots. The outlook for fall demand is regarded as fairly satisfactory, in view of the heavy reduction in price made some time since. We quote: Galvanized Barb Wire \$2.80 in carload lots to jobbers, and Painted at \$2.50, terms 60 days net, with 2 per cent. discount for cash in 10 days.

Plain Wire.—The market for Plain Wire is without any especial new features. Trade is quiet, and orders are generally for small lots. Quotations continue as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots.....	\$2.15	\$2.55
To jobbers in less than carload lots.....	2.20	2.60
To retailers in carload lots.....	2.25	2.65
To retailers in less than carload lots.....	2.35	2.75

The above prices are for the base numbers, 6 to 9. The other numbers of Plain Wire and Galvanized Wire take the advances indicated in the following table:

Plain Fence Wire Advances (Catch Weights).

Nos.	Base	Galvanized.
6 to 9.....		\$0.40 extra.
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " ".....	.40 "
12 and 12½.....	.15 " " " ".....	.40 "
13.....	.25 " " " ".....	.40 "
14.....	.35 " " " ".....	.40 "
15.....	.45 " " " ".....	.75 "
16.....	.55 " " " ".....	.75 "
17.....	.70 " " " ".....	1.00 "
18.....	.85 " " " ".....	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Pittsburgh.—Demand is fair, but for small lots only. There is no change in prices, and we quote:

	Plain.
To jobbers in carload lots.....	\$2.15
To jobbers in less than carload lots.....	2.20
To retailers in carload lots.....	2.25
To retailers in less than carload lots.....	2.35

Galvanized Wire up to No. 14 is 40 cents advance on Plain, Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

Norway Iron Bolts.—On account of the relatively high price of Norway Iron, genuine Norway Iron Bolts are held firmly. The high price which they command results from the much higher cost of the raw material. The demand for Norway Bolts is referred to as moderate, customers buying conservatively and only for immediate wants. The market in this line is thus feeling the effect of the tone of the general iron market, and manufacturers are not anticipating a heavy demand until values reach a settled base. A good deal of irregularity in price has been induced by the cutting on

the part of the jobbers, who make this line a leader and often undersell the manufacturers.

Oils.—*Linsed Oil.*—Spot Oil is moving in small quantities. Some inquiries have been made for future delivery. Orders could be booked by crushers for delivery during the next three months at 45 cents or less, but these figures are not up to manufacturers' views. The new crop of Flax Seed is beginning to come in from the Southwest, and is reported as showing an increase of about 10 per cent. over that of last season. Prices for prompt delivery of City Raw Oil remain firm at 67 cents per gallon in lots of five barrels or more, and 68 cents for less than five barrels. The usual 2 cents per gallon extra is charged for Boiled Oil.

Tire Bolts, Stove Bolts, &c.—A reduction was made July 26 in the price of Tire Bolts, the new prices being as follows:

Common	65 %
Eagle Philadelphia	72½ %
Norway Philadelphia	75 %

A reduction has also been made in Stove and Sink Bolts and Stove Rods, the discount on which is now 67½ per cent.

Cordage.—There is considerable irregularity in quotations on Rope, particularly for Sisal. Prices range from 10½ to 11 cents for Manila Rope, according to quantity, on the basis of 7-16-inch and larger; and from 7 to 7¼ cents for Sisal Rope, according to quantity, on the same basis. Demand is fair, but prices are referred to by manufacturers as unsatisfactory.

Glass.—The American Window Glass Company are reported as having their factories put in shape for an early start. They have not yet come to a satisfactory agreement with the flatteners regarding wages for the coming fire. It is estimated that there is less than 500,000 boxes of Glass now in the country, or about one-third of what was on hand at this time last year. It is stated that the cost of manufacture for the coming fire will be about 12 per cent. higher than for last fire, and that there is little possibility of prices being lower. In fact, higher prices are anticipated shortly. Quotations are as follows:

Carloads from Factory.

Single strength:	
First bracket .....	.85 and 10 %
Second and third brackets .....	.85 and 15 %
All above .....	.90 and 5 %
Double strength:	
First five brackets .....	.89 %
60-inch bracket .....	.90 %
70 and 100 inch brackets, inclusive ..	.90 and 10 and 5 %
All above .....	.90 and 20 %

Eastern Jobbers, Less than Carload Lots.

Single strength:	
First bracket .....	.80 and 10 and 5 %
Second and third brackets .....	.85 %
All above .....	.85 and 20 %
Double strength:	
First bracket .....	.85 %
Second, third, fourth, fifth and sixth ..	.85 and 10 %
All above .....	.85 and 20 %

Western Jobbers, Less than Carload Lots.

Single strength:	
First bracket .....	.80 and 20 %
Second and third brackets .....	.85 %
All above .....	.85 and 20 %
Double strength:	
First five brackets .....	.85 and 10 %
Sixth bracket .....	.85 and 20 %
All above .....	.85 and 25 %

Ten per cent. extra for single strength, A. A.

Freight equalized with nearest jobbing center.

Spirits Turpentine.—Demand for Turpentine is for immediate requirements, purchasers not anticipating their wants. The market is firm at this point at 44½ cents per gallon for Southern and 45 cents for machine made barrels.

Paints and Colors.—*Leads.*—There is a moderate distribution of White Lead in Oil, as is usual at this season.

Some orders are being taken for future delivery, but the uncertainty of the future Oil market deters buyers from anticipating their wants very generally. There are reports of prices being shaded on large lots. Manufacturers' quotations are as follows: In lots of 500 pounds or over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

Indiana Retail Hardware Association.

(By Telegraph.)

THE fourth semiannual meeting of the Indiana Retail Hardware Association opened Wednesday morning at Indianapolis, the delegates assembling in the convention hall of the Grand Hotel, with President W. H. Weed of Vincennes in the chair. A goodly number of Hardwaremen were present, among them quite a few who evidenced a desire to become members of the association.

The morning was devoted to the roll call, reading of the minutes of the last regular meeting and the reading of the report of the secretary-treasurer, W. W. Robb of New Harmony. Mr. Robb, owing to pressure of business, then tendered his resignation, which was accepted under protest. The question of electing his successor was laid over until the afternoon session. A motion was made and carried that a Question Box be a feature of the meeting, and slips of paper were distributed among the members for noting questions relating to the betterment of the retail Hardware dealer, the same to be taken up and discussed at the afternoon session. The meeting then adjourned, the delegates to reassemble at 1.30 in the afternoon.

Price-Lists, Circulars, &c.

MICHIGAN WHEELBARROW & TRUCK COMPANY, Saginaw, Mich., in an illustrated descriptive catalogue, envelope size, just issued, show a portion of the goods they manufacture. Among those described are Handcarts, Warehouse, Railroad, Store, Factory and Depot Trucks, all kinds of Bolted Canal, Garden, Stone, Mortar and Steel Tubular Wheelbarrows, and Baggage Barrows, Express Wagons, Coal Shutes, &c., in a variety of styles and sizes.

DEXTER HARRINGTON & SON, Southbridge, Mass.: Catalogue and price-list No. 4, devoted to Shoe Knives, Rubber Knives and Blades, Shoe and Cloth Blades, Butcher, Kitchen, Putty, Paper Hangers', Broom, Cigar Knives, &c. The catalogue shows and describes some 20 new styles and lines not heretofore illustrated. Their product is not, however, limited to the few styles shown, as they are constantly making a large variety of shapes and sizes to order. Owing to many changes in list prices they advise customers to write for new discounts before ordering.

NELSON LYON, 52 Green street, Albany, N. Y.: Price-list of the Lyon Egg Beaters, Ice Cream Dishers, Lightning Chopping Knife, Porcelain Egg Separator, Lyon Heel Stiffener, Blizzard Traps, &c.

NATIONAL ENAMELING & STAMPING COMPANY, New York: Catalogue of more than 600 pages illustrating the company's large and comprehensive line of goods.

GRAND RAPIDS HAND SCREW COMPANY, Grand Rapids, Mich.: In a catalogue entitled "Factory Furnishings" the company illustrate and describe Hand Screws, Case and Glue Clamps, Cabinet Makers' Benches, Carvers' Benches, Trucks, Saw Guards, Saw Tables and other factory supplies.

HOLROYD & Co., Waterford, N. Y.: Illustrated descriptive catalogue showing their full line of Stocks and Dies, Round Adjustable Die Plates, Taps, Dies and Threading Tools suitable for machinists, blacksmiths, bicycle repairers, steam fitters and similar workers of metals.

FOLLANSBEE BROS. COMPANY, 328-332 Second avenue, Pittsburgh, Pa., manufacturers of Roofing Tin Plate, have issued a finely illustrated catalogue containing photo-engravings shown merely to give an idea of the large extent of territory in which Tin Plate of their manufacture is used for roofing a varied class of buildings, such as United States public buildings, railroad depots, school houses, county buildings, private residences, &c.

CATALOGUE HOUSE COMPETITION AND HOW TO MEET IT.

The following is the substance of an admirable paper of C. W. CASPER of Marshall, Mich., which was presented at the recent meeting of the Retail Hardware Association of that State:

A FEW facts as to what catalogue house competition is. To use the statement of one large house they say: "We sell to you (the consumer) at wholesale prices and save you the retailer's profit." This is a very smooth statement. It will catch almost any one. We all want to save money. One would think the catalogue houses were the greatest philanthropists in the world. If their statements are really true they should be hailed as benefactors of the race. But there is no truth in their smooth, well worded statements. They do sell a few staple articles at a very low price, cost or less, and then everlastingly soak the buyer on goods upon which he can make no comparison. Again, they buy largely of seconds, imitations and inferior goods of all kinds. These are not sold in their true colors, but as first-class articles. Not only do they do this, but they are substituting imitations in place of regular patented goods. They use cuts of standard articles when the stuff they send out is a rank imitation. If the buyer kicks and returns the goods they then go to the jobber or maker, and buy the genuine article and send that, saying the mistake had been that of a clerk, and they had fired him at once.

Many of the leading catalogue houses are being sued at the present time for infringements. They also buy up large lots of damaged or inferior stock which the maker is ashamed to pin his name upon. No goods are so out of date that the catalogue house will not buy them if the price asked is low enough.

Many dealers to whom I wrote claim that they are not bothered by such competition at all, but their freight and express agents could tell a different story. The merchant may not be annoyed by having catalogue prices thrown up at him, but many hundreds of dollars of trade is being sent to catalogue houses right before his eyes, and this competition is a greater problem than many of us have any idea of. I have had express agents tell me that nearly one-third of their incoming business was catalogue house shipments.

In considering remedies, Mr. Casper said he wrote to many dealers and he was convinced that most of them were too confident that they could handle the question. They might convince a number of customers that these houses were not safe places to buy from, but they never hear of the hundred that are sending in their orders right along and saying nothing. Many dealers to whom he wrote said they always met catalogue prices, and usually went one better, but he did not think that was quite the truth.

PARALLEL COLUMNS.—He had taken the pains to get a list of about 150 articles which are priced in a couple of the largest catalogues. In this list he had taken one size or kind of each article. The list was composed of goods which are being used steadily by the farmers and customers of the average Hardware dealer, and are standard articles which are supposed to have but a single standard of quality the world over. Opposite the articles in this list he had put the catalogue price, the jobber's price to the retailer and the usual selling price. They footed up \$238.61 for the first, \$205.88 for the second, and \$267.27 for the third. Taking percentages, buying at jobber's selling price and selling at catalogue prices there is a profit of 16 per cent., while selling at regular prices there would be a profit of 30 per cent. In these calculations no allowance is made for freights. Mr. Casper added: "The catalogue prices are taken from the latest edition, which was published about April 1, while the jobber's prices are those of to-day. I doubt of there would be 10 per cent. profit on catalogue prices if the list was figured on the cost of the goods on April 1. As we well know, there

have been many reductions since then, and the catalogue houses usually follow the market. If all the articles on this list are genuine goods no retailers can meet the prices and keep the goods in stock.

HOW TO MEET THE CONDITION.—Taking it for granted that this list is of honest goods and not fakes, how are we to meet these prices? Only by buying as low as the catalogue houses. They buy as low as, if not lower than, many of our jobbers. Consequently they can sell at what the retailer pays for the goods and still make a fair margin. But how can we buy as low as the catalogue houses? Only by co-operative buying. But before we can do this we must have organization, not of town only but county and State and interstate. We must all be arrayed against the enemy.

A NATIONAL LAW SUGGESTED.—Mr. Casper then referred to the poor quality of goods sold as first class, and advocated a national law against selling a second or an imitation unless it was so branded. The pure food laws should go much further and make it unlawful to sell adulterated goods of any kind, or to advertise one thing and then furnish another. He thought also that by organization it would be possible to so control the sale of Hardware that other trades could not make advertising leaders and premiums of Hardware staples, as is now done by clothing, tobacco, dry goods, baking powder and general grocery houses. "If the retailer," said he, "will never buy a cent's worth from a maker or jobber who sells outside the trade it will not be long before this state of affairs will cease to exist." Summing up the price question, he said: "We can never hope to kill or cripple the catalogue houses by price cutting. If we could prevent their handling staples they would soon die as a result of their deception and misrepresentation on the balance of their stuff."

AGAINST THE PARCELS POST.—He thought the parcels post laws should be wiped out, as it was only in the interest of catalogue and department stores, and then indulged in the following speculation: Say it should come to pass that catalogue houses run the small retailer out of business. It would only be a few weeks before all the catalogue houses were in a trust or combination, and away up would go the prices and up they would stay. The people of this country must soon realize that it is far better for the wealth of the land to be distributed among the many rather than the few. It will never be the case if the catalogue house principles prevail.

ADVERTISING LOW PRICES.—It seems as if the principal advertising experts all advocate writing an advertisement which will knock the breath out of our competitor by the extremely low prices we can make on a certain article. As one of them said, "To advertise a \$10 article at \$9 will go further to convince buyers than anything else that could be written." Many dealers have written papers read before Hardware associations advocating selling leaders at cost or a little below. To make large displays of these leaders. If one does this he should never cry out in pain when the department or catalogue house hurts him. If you start on this trail, the first thing you know you will be buying seconds and imitations, and then you are trotting in the other class.

DIGNIFIED METHODS.—Would it not be far better for the Hardware trade to be the one that is above the "faky, schemy" methods of the day? We ought to have the most solid business in the world. It is one that requires great ability to make a success of it. Where is the business outside of the professions that requires the same amount of study and training? The racket stores started up to sell a grade of goods that the Hardware dealers did not think fit for their shelves. Ought we to fall to their level? Is it not the best policy to handle only good, honest, reliable goods and have our customers feel that when they have bought an article at our store

It must be the best and not a fake, because he bought it of a Hardware dealer?

NOT HOW CHEAP, BUT HOW GOOD.—There is no branch of trade that dare open up their methods and practices as the Hardware trade has done in the past few years.

The proceedings of the various Hardware associations make good, solid, instructive reading for any student or thinker.

I know it is not easy to stand up for highest quality in both goods and methods when assailed by low grade competition. But will not the success be all the greater when it does come?

Ought not the Hardware dealers' motto be, "Not how cheap, but how good?"

DISCUSSING MR. CASPER'S PAPER.

In discussing Mr. Casper's paper, A. K. Edwards of Kalamazoo told this about the working of one of the catalogue houses in his own town.

THE METHOD OF A CATALOGUE HOUSE.—We have a catalogue house which has grown up there within the last two years. They are handling almost altogether a line of Agricultural Implements and Carriages which we do not touch. Their method is to make a contract to buy the goods direct from the factory and have shipped to their various customers. They sell no goods except for cash. One of the partners in the concern told me that their mail averaged about 160 letters a day. All of them were not orders, but enough were to make it a very lucrative business. A great many of them contract with manufacturers right at home. These goods are shipped with their own label on them, and the manufacturer is not known in the business. In the matter of Farm Wagons they expect to sell 200 of them. Last year they sold over 100. These goods are painted a little different from the ordinary Wagon, and are shipped out with the label of the Cash Supply & Mfg. Company of Kalamazoo.

CONTRACTS WITH CARRIAGE MAKERS.—They also have contracts with a large number of Carriage makers. I brought a catalogue along with me. One of our boys picked it up rather unbeknown to them, and it will give you an idea. The catalogue was started two or three years ago with four or five pages; now it has 96 pages.

Suggested Remedies.

Mr. Edwards' corrective for the losses which the regular houses suffer from catalogue competition was strong and aggressive organization both within the State and through the Interstate Association. He would make the manufacturers responsible for all the goods found in the catalogue houses, and would say to them, "We will not buy your goods if we find them in catalogue houses." "If," said he, "we find a jobber who is selling to them we will assist the manufacturer to find that jobber. When we find him I believe he should be disciplined, and the manufacturer should refuse to sell him goods until he has satisfied the manufacturer and this organization that he will stick to the business that is made, and not ship to the new business that has lately grown up so rapidly in this country."

Testing Linseed Oil.

A SUBSCRIBER asks for some method of testing Linseed Oil to find whether or not it is adulterated. As this subject may be of interest to many of our readers, we give herewith a test for Raw Oil, issued for the benefit of the trade by the National Paint, Oil and Varnish Association in 1898, as follows:

Put equal parts of Raw Linseed Oil and nitric acid in a bottle together. Shake the mixture well and let it stand for 20 minutes. If pure, the upper stratum will be straw colored and the lower colorless. If impure, the upper stratum will be a dark brown or black and the lower stratum a bright orange or dark yellow, according to the material used in adulterating.

Export Notes.

TO show the tremendous growth of exports from the United States of manufactured merchandise, as compared with all other exports (excepting gold and silver), we give herewith some official Government figures. We will not reproduce the yearly totals in dollars for 40 years, it being sufficient for the purpose to say that the entire exports of merchandise (excepting gold and silver) for 1860 was \$316,242,423 and for 1900 (fiscal years ending June 30) \$1,370,476,158.

The total of exported domestic merchandise, other than manufactures—i. e., agriculture, mining, forest, fisheries and miscellaneous—for 1860 was \$275,896,531, and of domestic manufactures \$40,345,892. Similar totals for 1900 are respectively \$938,191,792 and \$432,284,366. These totals are simply given to show the magnitude of the export business.

The table of percentages below indicates unmistakably that we have made great progress as manufacturers, involving as it does a great volume of trade. A few years selected at random might be misleading, but the general average for the 40 years tells its own story. The five great classes—namely, agriculture, mining, forest, fisheries and miscellaneous—have decreased from 87.24 per cent. of our entire exports in 1860 to 68.46 per cent. in 1900, while domestic manufactures alone have increased from 12.76 per cent. of the whole in 1860 to 31.54 per cent. in 1900.

Our purpose is to show the unparalleled increase of manufactures exported and the almost invariable increase from year to year, as indicated by the following table of percentages. It will be noticed that domestic manufactures exported equal nearly one-half of all other exports of every character in 1900:

Percentages of Total Exports from United States.

Domestic merchandise other than manufactures. Agriculture, mining, forest, fisheries, miscellaneous.	Per cent.	Domestic manufactures.	Per cent.	Domestic merchandise other than manufactures. Agriculture, mining, forest, fisheries, miscellaneous.	Per cent.	Domestic manufactures.	Per cent.
1860.....	87.24	12.76	1887.....	80.55	19.45		
1870.....	85.00	15.00	1888.....	80.95	19.05		
1875.....	83.43	16.57	1889.....	81.01	18.99		
1876.....	82.92	17.08	1890.....	82.13	17.87		
1877.....	78.84	21.16	1891.....	80.63	19.37		
1878.....	82.21	17.79	1892.....	84.39	15.61		
1879.....	83.28	16.72	1893.....	80.98	19.02		
1880.....	87.52	12.48	1894.....	78.86	21.14		
1881.....	87.08	12.92	1895.....	76.86	23.14		
1882.....	81.62	18.38	1896.....	73.52	26.48		
1883.....	83.31	16.69	1897.....	73.13	26.87		
1884.....	81.19	18.81	1898.....	75.98	24.02		
1885.....	79.75	20.25	1899.....	71.79	28.21		
1886.....	79.50	20.50	1900.....	68.46	31.54		

The figures just published by the Bureau of Statistics at Washington show that the total exports of 1900 are four times as great as in 1860, but in domestic manufactures are nearly 11 times as great—i. e., \$432,284,366 to \$40,345,892. Taking the last decade alone, the exports of manufactures are equally striking. In 1891 the total exports of domestic merchandise were \$872,270,283, while those of domestic manufactures were \$168,927,315; thus, while the total exports for 1900 were but 57 per cent. in excess of 1891, the exports of domestic manufactures were 156 per cent. greater. In all of the foregoing calculations no account is taken of foreign goods, dutiable and free of duty, re-exported, amounting in 1900 to \$23,710,213, or gold and silver.

A graphic illustration of the growth of manufactured exports from the United States by a recent consolidation in an important line of goods is afforded by the following figures:

The company alluded to have been organized in their present form about 18 months, have nearly \$100,000,000 capital and an annual productive capacity of 1,500,000

tons. The feature of this exhibit is the difference between concentrated and isolated effort. Comparing a year's exports since the beginning of the present company with the total exports of the 30 odd individual constituent companies (most of them important in themselves) for a period of eight years, it is found that the total for the year equals about 40 per cent. of the total for the eight years preceding the consolidation in tonnage, and about 60 per cent. of the total in money value.

American manufacturers are more and more recognizing the importance and necessity of meeting the views of foreign buyers and the requirements of markets abroad, recognizing as they do the indispensability of a world wide market in which to dispose of an ever increasing surplus. The shrewd ones are not wasting energy in trying to force on the various and diverse types of civilization what suits Americans and what is applicable to this market, but where feasible and practicable are making such goods as foreigners can use and putting them up as requested. After our manufactures have been thoroughly introduced the foreign trade can better be brought up to our standards and induced to accept what is regular with us, perhaps.

The following incidents which recently came to our attention from large interests who are assiduously cultivating a broader market will serve as more than a hint to the keen merchant who realizes the effect of intense competition in this usually glutted market, and the advantage of widely distributed marts, especially when trade is dull here. Reference was made to a staple as common as Nails (although those were not the goods) which the foreign demand required should be wrapped in paper and tied with string (a practice long out of date with us), instead of being put up in neat double paste-board boxes, as is universal here. The company who are seeking the trade will wrap and tie as requested, "stoop to conquer," as it were.

A manufacturing company, with offices in New York and factories in 12 States, found certain kinds of Tinned Wires bought abroad were put up in black paper in Germany and England, the contrast between the black covering and bright tinning greatly enhancing the appearance of the Wire. An export order for such goods filled by them was wrapped in whatever paper was being used at the time, but the resulting criticism was heeded and without argument the concession was made. Hereafter the goods will be wrapped as requested, costing little, if any, additional expense or trouble.

Another grievance has been the coiling of Market and kindred Wires, the English and German practice being to so coil it that with every multiple of two coils one nests within the other, thereby economizing space and permitting the goods in warehouses to be piled twice as high as is possible with American coils. This can also be done at slight, if any, additional cost, and, we are advised, will be done in the future.

While all that is asked for cannot always be done, manufacturers are meeting the foreigner more than half way, and are also showing greater liberality in the transaction of business than was customary in the past, when factories were kept going to their capacity to supply our own market.

Chas. B. Corwin, for many years secretary and general manager of the H. B. Newhall Company, New York, has since 1885 been closely identified with the export trade on his own account. For about six years he has been located at 15-25 Whitehall street, New York, as a direct representative of American manufacturers for export trade and in that time has built up a substantial business. He does not seek direct orders from abroad, but markets the goods of the manufacturers whom he represents on a salary basis through commission or ex-

port houses in this country, especially in New York. He has devoted much attention to Machinery, Agricultural Implements and kindred metal lines, on account of his close connection with goods of this character while in the Hardware trade. He represents for export the goods of 51 American manufacturers.

Some conception of the extent and importance of New York as a market for export trade is reflected in the fact that for some years past he has made a practice of keeping, by constant revision, an up to date list of export merchants in this city who buy goods for almost all markets. This list contains about 400 names of concerns handling a general line of manufactured products, and has been prepared especially for the guidance and information of the manufacturers he represents, who use it in opening correspondence with (to them) new concerns, and likewise for sending catalogues, price-lists, circulars, samples, &c. An outside manufacturer who secured a copy of this list recently stated that he got 40 inquiries out of the first 100 addressees and 60 from the second 100 addressed.

W. K. Peters, president of the Gleason-Peters Air Pump Company, 20 West Houston street, New York, has just returned from a business trip through England and France. He was much impressed with the desire of buyers in those countries to secure anything in the way of labor saving machinery so largely produced in the United States, especially in the way of Lathes, Machine and Hand Tools, &c., in preference to goods made in other countries. He referred to the fact that some of them were willing to wait two years for certain goods made by a well-known New England concern, when they could, so to speak, go around the corner and buy something similar made in their own country for immediate delivery. They seem to have the utmost confidence in American labor saving devices. Another thing to which he calls attention is that while they want to buy our goods, they prefer to buy them of native concerns or American branch houses located there. He found a very friendly feeling in England for us and our goods, not exhibited a few years ago during other trips to that country.

In an early spring issue of *The Iron Age* attention was called to the fact that a New York architect had prepared plans for a plant to cost something like \$100,000 for a town in Africa. It was also stated that certain machinery would be required for this factory. In regular course the architect wrote to a Western manufacturer, and in due time received a reply, both communications being of the usual business character. There the matter dropped, but a New York exporter, who represented this Western manufacturer, noticing the item, took the matter up with the New York architect, and, to make a short story of it, in two weeks closed a contract for \$19,800 worth of machinery, for which contract has been signed, and which will be shipped before winter. We might add that the fact that the communications above alluded to had passed between the two concerns was not known to the New York representative, and he says if it had not been for the paragraph in *The Iron Age* and his personal exertions the contract would not have been made.

Request for Catalogues, &c.

FIRE on July 15 destroyed the stock of Samuel Hill, Prescott, Ariz., dealer in Hardware, Iron and Steel, Stoves, Tinware, Fire Arms, Mining, Plumbing and Roofing Supplies, Crockery, Glassware, Lamps and Paints and Oils. His collection of catalogues and price-lists was also destroyed, and Mr. Hill requests that such printed matter relating to the above lines be sent to him. He will also value copies of catalogues devoted to store fixtures, &c., as he is intending to commence at once the erection of a fine modern establishment.

Parcels Post Difficulties.

THE following communication from a correspondent in Aguascalientes, Mexico, calls attention to some of the inequalities or burdens of the parcels post system in operation between Mexico and the United States:

Having a great deal of business by parcels post from the States, we are naturally admirers of the system—it is of incalculable benefit.

All the more are we surprised when we find that, like a poor rule, it does not work both ways. Parcels coming to Mexico have the proper duty assessed at the port of entry or at Mexico City; parcels going to the States seem to be subject only to the individual caprices of postmasters. At times packages which should pay \$5 or \$10 duty pay none; at other times double the proper rate is assessed. Some postmasters at interior points open foreign packages, send them to the nearest port of entry, and there duties are assessed more or less nearly the right amount. Upon the return of the package the consignee is called to the post office and has read to him a statement from the collector of customs, telling him he has committed a heinous offense importing goods by mail contrary to law.

We recall a case where a package was sent from this point to a town in Texas. The actual value, as properly declared on the blanks furnished here for the purpose, was \$2.50 silver, or \$1.20 United States; the rate 60 per cent. ad valorem. The duty assessed was \$1.75—more than double the proper amount.

Are there no regulations, or if there are why are postmasters not familiar with them? Does the parcels post only work one way? Is it unlawful to import goods into the United States by mail? Why, then, are such contraband parcels not stopped at the ports of entry? If the importation by mail is lawful, why is it not so regulated that packages are assessed where there are persons competent to assess them correctly? Why should persons in one State or town be allowed to import free what persons in other towns cannot import without breaking the law?

These facts seem worthy the attention of the Treasury and Post Office departments.

Inquiry among the post office and customs officials has developed the following conditions, which explain, while not remedying, the defects. They admit there are doubtless causes for complaint in the working of the Parcels Post Convention, some of which seem to be unavoidable. The chief difficulty is the proper assessment of duty on a package, which is contingent on the appraisal applied by the official through whose hands it passes to the addressee. In a country having, as the United States has, approximately 75,000 post offices and parcels post conventions with 19 different countries, it is almost impossible to have in all places properly qualified postmasters capable of making a correct appraisal, which in practice would involve, at the least, a fair knowledge of values of the merchandise of the 19 different countries.

Through the ports of entry this could be correctly done by the customs officers in connection with the Post Office Department. If a package is registered and sealed it makes the matter still more difficult, as it cannot be opened by any one but the addressee. In such a contingency the addressee is sent for, who opens the package, and the postmaster calls in the nearest customs official to appraise the contents. It can be readily seen that such an official might be conveniently near or otherwise. If the package is not sealed such work is done at the port of entry by a customs officer, the assessment determined and the amount communicated to delivery office.

It should be understood that the Parcels Post Convention does not alter, abrogate or change in any way the customs laws of any country between which the packages pass. It merely changes the method of transportation from a regular (through custom house) to an irregular (through post office) channel, and as the main business of the Post Office Department is the handling of mail matter only, it is not strange that an army of postmasters are not qualified to accurately determine the values of foreign products in so many different countries.

It should also be understood that the commercial territory of Mexico is of comparatively small area and the

post offices few in number, as compared with the United States, while the United States, being a large manufacturing nation from which Mexico draws much, the postal and customs officials have greater opportunities for keeping in touch with our values, the reverse being true on this side of the border, as little matter from Mexico probably comes by post, the character of our imports being more in the nature of raw material in bulk.

Trade Items.

GEORGE W. TROUT & CO., Chicago, have been appointed agents for the Reading Screw Company, Norristown, Pa. This company manufacture a full line of Wood Screws and also make the Colton Transom Lifts. A full and complete stock of both Screws and Lifts will be carried by the Geo. W. Trout Company.

THE H. F. BRAMMER MFG. COMPANY, Davenport, Iowa, manufacturers of the O. K. Rotary Washer, advise us that the demand for this style Washer shows a steady increase. The manufacturers claim it is the only rotary Washer that has revolving steel ball gearing, reducing the friction, and thus making the machines light running and practically noiseless. The tub is made of Louisiana red cypress and the legs are solid with tub. The wheel turns either right or left, the pin wheel or dasher reverses automatically, turning the clothes back and forth through the hot soap suds and cleaning them thoroughly without injury to the clothes. The lid on the tub is made to close tight, so there is no escape of steam and soap suds odor about the house. The company are prepared to make arrangements with dealers to handle this Washer in territory not at present occupied.

UNDERHILL, CLINCH & Co., 94-96 Chambers street, New York, have just been made the direct representatives of the Miller Lock Company, Philadelphia, Pa., for New York and its immediate vicinity. They will carry a full stock of the goods and display samples of them in their new sample room. The point is made that a full line of this make of goods has never been carried here before, and it is believed that the business will be stimulated and result in calls for this kind of Lock through other jobbing houses. This company manufacture a large variety of Key and Keyless Padlocks for almost every purpose.

A REORGANIZATION of the Atlas Tack Company, Taunton, Mass., has just been completed. The new company has been formed under the laws of New Jersey, with a capitalization of \$700,000. At a meeting held in New York City on the 25th ult. the following directors were elected: H. H. Rogers, H. H. Rogers, Jr., U. H. Broughton, John Bushnell and G. W. Weymouth. The officers of the company are as follows: G. W. Weymouth, president and general manager; U. H. Broughton, secretary and treasurer, and H. A. Holder, assistant secretary and treasurer. The business will be carried on at the various plants as usual for the present.

AT the annual meeting of the Gilbert & Bennett Mfg. Company, held at Georgetown, Conn., on the 24th ult., the following directors were elected for the ensuing year: Edwin Gilbert, David H. Miller, Samuel J. Miller, Geo. H. Brown and Edward F. Jones. The directors elected the following officers: Edwin Gilbert, president and treasurer; David H. Miller, vice-president and secretary, and Samuel J. Miller, superintendent. A dividend of 6 per cent. was declared.

PHENIX MFG. COMPANY, Milwaukee, Wis., in their advertisement in this issue call attention to the Phenix Fastener No. 3 for storm sash and screens. A sample of the Fastener will be mailed on receipt of 5 cents in stamps.

E. A. GRENZEACH, 116 Beekman street, New York, besides representing the J. P. Eustis Mfg. Company, Boston, Mass., is the New York representative of the Ferro-Steel Company, Cleveland, Ohio, who manufacture a full and complete line of Hot Air and Ventilating Registers in all finishes and any design. He also represents the Rome Mfg. Company, Rome, N. Y., who are producers of full lines of Copper Tea and Coffee Pots, Hot Water Kettles, Wash Boilers, Trays and other specialties in nicked copper ware. Samples of all the lines referred to are carried at the above address.

THE announcement is made that the corporation heretofore operated under the name of Foster Brothers Company assumed July 10 the name of Foster Brothers & Chatillon Company. This company have recently purchased the plant formerly operated by the Phoenix Knife Company for the manufacture of Pocket-Knives, and they have made extensive additions to their factory, having now completed a fully equipped plant for the

manufacture of Butcher Knives, Cleavers, Steels, &c., as well as Pocket Knives. John Chatillon & Son, 89-93 Cliff street, New York, will continue to act as sole sales agents, as heretofore.

E. BERTRAM PIKE, secretary and treasurer of the Pike Mfg. Company, Pike Station, N. H., manufacturers of Sharpening Stones, returned August 1 on the "Oceanic" from a three months' trip to Europe, where he went to install their Paris Exposition exhibit.

SHEBLE & KLEMM, Frankford, Philadelphia, Pa., for whom Peter McCartee is agent, 79 Chambers street, New York, announce that their new plant is now completed and in full operation. The plant is constructed in the most improved manner and is equipped with machinery best suited for the work intended. They accordingly solicit the orders of the trade for Farm and Garden Forks, Rakes, &c., of excellent quality and workmanship.

At a meeting of the Board of Directors of G. & H. Barnett Company, Philadelphia, held on the 25th ult., to fill vacancies caused by the death of their late president, Henry Barnett, the following officers were unanimously elected: Henry W. Scattergood, president and secretary, and Alfred W. Barnett, vice-president and treasurer. George F. Barnett was chosen to fill the vacancy on the board.

On July 10 there was opened in St. Louis the first St. Louis furniture exposition, which is to continue until August 25. The exposition is open only to merchants dealing in the goods exhibited, but Wednesday, July 25, was especially devoted to the reception of the executive officers of the various business associations of St. Louis in order that the importance of the enterprise might be more clearly brought out. The number of exhibitors is quite large, especially inasmuch as the project is an entirely new one. Furniture of every grade and designed to suit every taste is neatly displayed, and some especially creditable exhibits of Brass and Iron Bedsteads were noted, among them those of Smith & Davis Mfg. Company and Foster Bros. Mfg. Company. The manufacturers and dealers of cabinet Hardware embraced the opportunity to take part in the exposition and have arranged suitable samples.

John H. Graham & Co.'s Export Catalogue.

JOHN H. GRAHAM & CO., 113 Chambers street, New York, have just issued an export edition of their illustrated catalogue which is entirely distinct from their catalogue for the domestic trade noticed in our last issue. This book is exclusively for export trade, and includes a complete line of goods of 48 manufacturers, for whom they are the exclusive agents for export, with the exception of the goods of the Continental Tool Company, a recent acquisition, the arrangements for which were made too late to be included, but additional pages covering this line will be furnished for the catalogue. The book is bound in stiff cloth covers, contains 382 pages, 11 x 8 inches, and describes the goods suitable for export of 48 manufacturers, whose product includes Mechanics' Tools, Builders' and Shelf Hardware, Railroad Tools and Supplies, Carpenters' Tools, House Furnishing Hardware and Wooden Ware, and many American Hardware specialties. A valuable feature is the incorporation wherever practicable of the contents of full cases, dimensions and gross and net weights; characteristics that will appeal to the foreign trade. They will be pleased to furnish a copy to any foreign house through their regular New York buyer.

Among the Hardware Trade.

H. A. Simons has removed his stock of Hardware, Stoves, Tinware and Harness from Castala to Platte, S. D.

H. H. Newkirk's Hardware store at Beaver, Pa., was recently robbed of \$150 worth of goods.

Sharp & Almind, Long Beach, Cal., dealers in Hardware, Stoves and Agricultural Implements, have moved into a new building.

Lyon & Ferris have dissolved partnership in the Hardware and Stove business at Smyrna, N. Y., and have been succeeded by W. W. Lyon & Son, W. W. Lyon having been a member of the former firm.

F. M. Gallant, Davenport, Neb., has disposed of the business recently purchased from J. A. Boggs to William Lawrie, who is continuing at the old stand.

L. J. Vinier, dealer in Stoves, Tinware, Agricultural Implements and Sporting Goods, Carthage, N. Y., has built a 47-foot addition to his store, and will add a line of Builders' and Shelf Hardware to his former stock.

Tampa Hardware Company, Tampa, Fla., have increased their capital stock from \$15,000 to \$50,000, on account of their enlarging business and the fact that they are intending to enter the jobbing field.

The Standard Hardware Company, Okarche, O. T., have disposed of their business to Newton & Driskill.

Manchester & Gill have purchased the Hardware business formerly conducted by Mrs. M. J. Gifford, at Skidmore, Mo.

Edward Weber has succeeded Weber & Jones in the retail Hardware, Stove, Tinware and Agricultural Implement business at Dexter, Mo.

Reiff & Jaynes are successors to Puetz & Reiff, at Early, Iowa.

Thomas E. Ashton, Hardware, Stoves, &c., Holton, Kan., has removed his stock to Mayetta.

E. H. Sidwell & Co. have succeeded A. J. Hoffman in the Hardware, Farm Implement and Vehicle business at Springville, Iowa. Mr. Sidwell had been in the employ of Mr. Hoffman for about a year and a half.

O. W. Brown & Son have purchased the business formerly carried on by Molyneaux & Wainwright, Tilton, Iowa.

The interests of Henry Parmenter and the Cabool Hardware Company of Cabool, Mo., have been consolidated in the Parmenter-McDowell Hardware Company. The company handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods, and have also added a line of Furniture.

Miscellaneous Notes.

J. P. Eustis Mfg. Company.

J. P. Eustis Mfg. Company, 92 North street, Boston, Mass., recently opened a branch house at 116 Beekman street, New York, in charge of E. A. Grenzbach, as manager. This company, who style themselves "The Brasscrafters," make a full line of bathroom fixtures and specialties, including towel bars, glass shelves, tub sponge and soap holders, tumbler and toilet paper holders, &c., in brass, nickel plated, the joints of which are brazed and silver soldered. They also have an assortment of towel shelves which are made of 1/2-inch brass bars, which are heavier, it is remarked, than ordinarily made. Another specialty is a "neverslip" towel bar made with straight and twisted diamond shaped bars. A catalogue, styled C, recently issued, shows the entire line and will be sent on application.

Bayonne Knife Company's Display Assortments.

The Bayonne Knife Company, 57 Warren street, New York, are making a specialty of putting up assortments of goods such as shaving sets, pocket knives, shears, razor strops and plated flat table ware. In shaving sets some contain a few articles for travelers' use, while others of a more elaborate character are designed for home purposes. One for travelers is a flexible container in compact form containing razor, strop and brush; others in leatherette cases contain razor, mug, strop, brush, soap, magnesia, cosmetics, mirror, &c., varying in assortment according to the cost. These sets differ in price according to the quality of the razor used and the number of articles in a set, the sets having a range in price to the trade of from 35 cents to \$2.25 each. They also put up pocket knives and scissors in display cases containing from 12 to 144 knives, which are designed to retail uniformly at from 25 cents to \$1.50 each, according to the assortment wanted. These cases are of cardboard with leatherette lined compartments. Some cases containing a gross or half gross are made of oak similarly lined. They also offer for display purposes racks and cork balls which are used for exhibiting scissors; also cork balls for showing knives; the blades of knives or scissors being forced into the cork and the racks or balls being suspended from the ceiling, consequently taking up no counter space. Razor strops for the same kind of trade are offered in connection with stands or wire racks put out in price lines for, say, 25 to 50 cents each, and sold usually in 12 styles to the gross, one dozen of each pattern. The advantage to the dealer in goods so shown is that any one within

seeing distance knows at a glance the price of anything in the group; a large number of patterns and styles of uniform price are seen at once and a demand often stimulated by the article and price being in sight.

The S. M. Howes Company.

The S. M. Howes Company, 40-46 Union street, Boston, Mass., are manufacturing a line of French folding screens for fire places which they refer to as heavier, smoother finished, wider in the flanges, and generally stronger made than the imported articles. They are prepared to furnish these screens in pure brass, gilt lacquer and Berlin black, and in quantities at a price less than the imported screens can be bought for.

Sharpening Steels.

The Goodell Company, Antrim, N. H., and 10 Warren street, New York, have just put on the market a line of steels for butchers' and family use, which will be known in the trade as the Rising steels. The peculiarity of this steel is a series of deep knife edged parallel grooves, several hundred in number, cut longitudinally the length of the steel, the effect of which in this device is to give an exceptionally keen edge to blades used upon it. In operation the best of steel blades bite perceptibly in the process of sharpening, removing minute metallic chips or shavings from the metal, which vary in size and number with the pressure exerted and the number of strokes. They are made both in regular and magnetized form for both butchers' and table use. The butchers' steels have handle mountings of ebony, cocobolo and stag handles, the table steels being made to match various styles of carvers including celluloid, rubber, ebony, cocobolo, stag, &c.

New Western Rotary Washers.

The accompanying illustrations represent rotary washers offered by the Anthony Wayne Mfg. Company, Ft. Wayne, Ind., and St. Louis, Mo. The gear consists

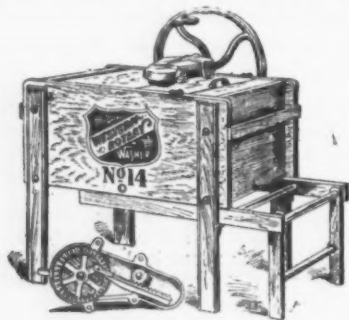


Fig. 1.—The New Western Rotary Washer No. 14.

of one large pinion fastened on the shell or cover, with a small pinion attached to the post which holds the pin wheel, and another small pinion which meshes in the



Fig. 2.—The New Western Rotary Washer No. 15.

larger one and is attached to the shaft. A rack bar conveys the motion from the large pin wheel to the post and pin wheel by means of the small pinion attached to

the post, as shown in the cuts. The gearing is self contained, it is pointed out, and therefore cannot get out of order, irrespective of whether the hand wheel is turned forward or backward, as, it is explained, in either case the pin wheel will be set in motion, and the washing accomplished either with backward or forward movement. The gearing is entirely covered with a shell top to prevent any accident or breakage of the gearing proper, and to keep dirt, dust, &c., from the cogs. The hand wheel, which is the heaviest casting on the machine, is attached to the body of the washer, and will not lift with the



Fig. 3—Interior of Western Washer.

cover. The machine locks automatically when it is closed, and is fitted with the company's patent galvanized iron pin wheel. All parts of the gears, it is stated, are made from patterns with cut gear to insure working noiselessly and without jarring.

New Century Rotary Washer.

New Century Washing Machine Company, 6-8 Washburn avenue, Chicago, Ill., have put on the market the New Century rotary washer, as here illustrated. It is made of white pine, with sides and bottom corrugated, having heavy steel hoops on the top and bottom and a heavy electric welded wire hoop in the center. It is said



New Century Rotary Washer.

to be perfectly noiseless and without jar or shake when the machine reverses its motion. There are no clutches or springs. The fly wheel is so placed as to balance the cover when it is open. The machine turns backward and forward, and, it is said, does excellent work both ways. Every machine is warranted.

The Easy Gearless Washer.

The Sweatt Mfg. Company, Minneapolis, Minn., are manufacturing the Easy gearless washer here illustrated. This washer is referred to as involving a new mechanical movement for rotating the dasher. There



Fig. 1.—The Easy Gearless Washer.

is no clutch, ratchet or other complicated device for reversing the action. It is said to be entirely noiseless and all bearings are machine turned and properly fitted. The dasher wheel contains three paddles or beaters and rotates one-third of the circumference of the tub, the beaters therefore traveling the entire inside circumference of the corrugated area. This action is referred to as being similar in principle to that employed in rubbing clothes on a common washboard, being a short, rapid stroke. The dasher wheel makes one complete stroke at

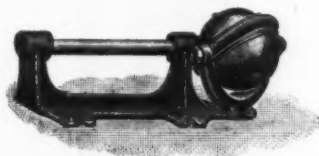
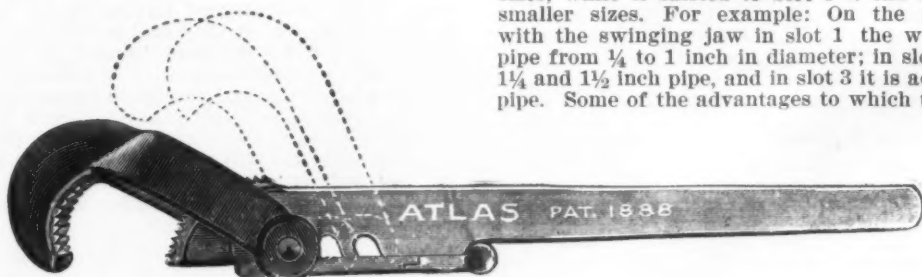


Fig. 2.—Mechanism for Rotating the Dasher.

one turn of the fly wheel, the gearless feature for transmitting the power to the dasher being shown in Fig. 2. The arrangements of the beaters, it is shown, tend to force the clothes to the outside against the corrugated rubbing surface of the tub. The water is kept continually in a state of agitation and the contents of the tub are kept in motion. The washers weigh 60 pounds each.

Empire Cigar Knife.

The Empire Knife Company, Winsted, Conn., have recently put on the market the Empire easy opener cigar knife, as here illustrated. This company have arranged with George W. Korn, Chicago, Ill., who con-



Atlas Pipe Wrench.

trols the patent in this country for the G. Paffrath spring knife, for the exclusive right to apply the patent spring to their easy open cigar knife. The characteristic of this knife is the ease with which the blade is opened. By an ingenious method, pressure on the top of the nail blade causes the cigar blade to spring open

ready for use in cutting off cigar ends. The knife contains a nail blade, an ordinary knife blade and the cigar



Empire Easy Opener Cigar Knife.

cutter blade. The blades are made of the best English crucible steel, and every knife is guaranteed.

Donnelly's Christmas Tree Holder.

John Donnelly, Branford, Conn., is manufacturing Donnelly's Christmas tree holder, as illustrated herewith. The feature of the holder is that it can almost instantly be applied with the use of only a hammer.



Fig. 1.—Donnelly's Christmas Tree Holder, Open.

The frame, as shown in Fig. 1, is made of wood, the dimensions of the strips being 24 x 1 3/8 x 3/4 inches. The iron socket shown in the upper part of Fig. 1 is hollow and sharpened with the bevel on the inside, being 11-16 inch in diameter. This is driven 1 inch into the butt of the tree and a 1/4-inch machine bolt, which holds the two arms of the frame together, can be screwed into the



Fig. 2.—The Holder Folded for Shipment.

socket by merely turning the arms. The point is made that any tree can be secured in this way with no danger of splitting, and can readily be given a perfectly upright position. The tree holder is finished in green and for shipment is collapsed or folded as in Fig. 2.

Atlas Pipe Wrench.

Atlas Pipe Wrench Company, 21 Liberty street, New York, have put on the market the Atlas pipe wrench here illustrated. It is made of a special wrench steel, drop forged, and every wrench is tested. The illustration represents the swinging jaw of the wrench in the slot marked 3 for the larger sizes of pipe. By shifting the jaw into slot marked 2 the wrench can be used on medium sizes, while if shifted to Slot 1 it can be used on still smaller sizes. For example: On the 18-inch wrench with the swinging jaw in slot 1 the wrench will turn pipe from 1/4 to 1 inch in diameter; in slot 2 it will take 1 1/4 and 1 1/2 inch pipe, and in slot 3 it is adapted to 2-inch pipe. Some of the advantages to which the manufactur-

ers refer are that it cannot slip, crush or lock on the pipe. There are no threads to strip and no nuts to jam. The wrench is made in four sizes, the lengths over all when open being 10, 18, 24 and 36 inches. A series of four wrenches will handle anything from 1/8 inch wire to 4 1/2-inch pipe.

Universal Hand Drill Press.

Millers Falls Company, Millers Falls, Mass., and 28 Warren street, New York, are just introducing the Universal hand drill press here illustrated. Fig. 1 shows the

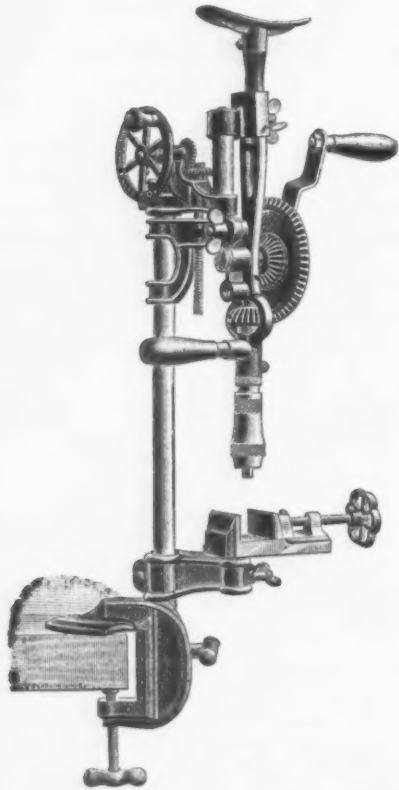


Fig. 1.—Universal Hand Drill Press with No. 12 Breast Drill.

standard and frame in drill press, designed for use in connection with their No. 10, 12, or 18 breast drill, when attached to the standard, the No. 10 breast drill being

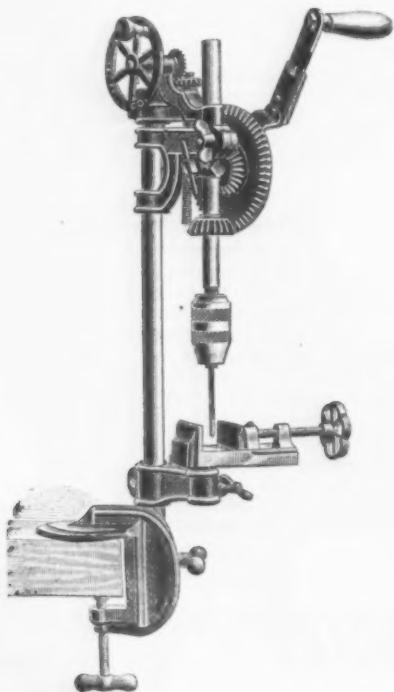


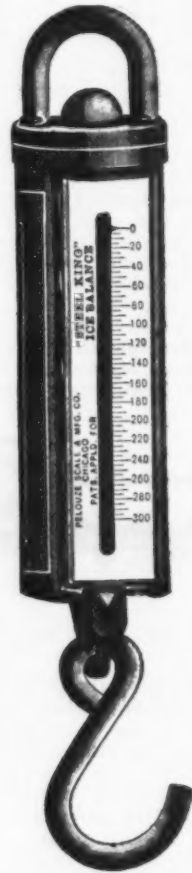
Fig. 2.—Press Fitted with Special Drilling Attachment.

converted with equal ease. The bench clamp, vise rest and frame are all clamped to the vertical standard and so can be moved up and down, or swung to the right or left, and by means of the thumb screws clamped or se-

cured at any desired point. The vise is hung on a pin which is off center, so as to give the operator the advantage of a variety of positions. If desirable, the tool can be utilized to work below the bench, by dropping the frame and fixtures downward on the standard and securing the upper end of the standard in the bench clamp. This is referred to as a great convenience in bicycle repairing. There are also a number of other positions, heights and adjustments that will suggest themselves as necessity demands. Fig. 2 represents the Universal hand drill press with special drilling attachment provided for it. This drill attachment has two gears, the large one 5 inches in diameter and the smaller one 2 inches in diameter, with extension handle, three-jawed chuck, taking straight shank drills from 0 to $\frac{1}{2}$ inch.

Steel King Ice Balance.

Pelouze Scale & Mfg. Company, 137-139 South Clinton street, Chicago, Ill., have just put on the market the Steel King ice balance, here illustrated. Some of the features of this balance to which they refer are that it is made entirely of steel, with no castings to break and



Steel King Ice Balance.

no screws to shake loose. The dial is much longer than customary in this class of scales, and is very distinct, being nickel plated and having large black figures. Each scale has what they call a "limiter," so that the spring cannot be strained beyond its capacity. The scale can be quickly adjusted, if necessary, by removing the cap on top and turning a screw slightly. Parts can be supplied separately and replaced by the owner without returning the scale to factory. They are made in three sizes, No. 200 weighs 200 pounds by 2 pounds; No. 300 weighs 300 pounds by 5 pounds, and No. 400 weighs 400 pounds by 5 pounds. They are boxed and weigh $4\frac{1}{2}$ pounds each.

Three warehouses owned by the Tyler Hardware Company, Tyler, Texas, were destroyed by fire a short time since. Their retail department was not, however, damaged. The company have purchased three brick buildings, 20 x 150 feet each, to take the place of those destroyed, which they will occupy September 1. The loss occasioned by the fire amounted to \$4000. All the goods have been replaced.

Publishers' Department.

ADVERTISING CUTS FOR HARDWARE MERCHANTS.

We are now ready to furnish the Cuts represented herewith, Nos. 600 to 617, which have been added to



our series of advertising cuts for the use of the Hardware merchant. The price of the cuts is 20 cents each, or six for \$1, postage paid.

USES MADE OF SOME OF THE IRON AGE ADVERTISING CUTS.

The accompanying illustrations convey an idea of how a few of the large line of *The Iron Age* Advertising Cuts have been used by Hardware merchants. The illustrations are reduced reproductions of advertisements from newspapers, &c.

FOR HOUSEKEEPERS.—In Fig. 1 is shown a portion of a large advertisement, the part illustrated occupying a space $2\frac{1}{4} \times 6\frac{1}{2}$ inches in the paper, in which are used *The Iron Age* Advertising Cuts Nos. 581, 527, 588, 530, 572 and 577. The small cuts and judicious arrangement of them permits of a great deal being said of the goods, including prices.

SATISFIED.—The advertisement Fig 2, showing Cuts Nos. 589 and 534, is complete as it appeared in the paper, and occupied a space $4\frac{1}{2} \times 4\frac{1}{2}$ inches. Mr. Doxsee writes as follows regarding *The Iron Age* Advertising Cuts:

The inclosed advertisement shows the use of some of the small cuts purchased from you a short time ago.

The cuts you are furnishing the Hardware dealers are just right for any sized advertisement and enable the advertiser to present an advertisement

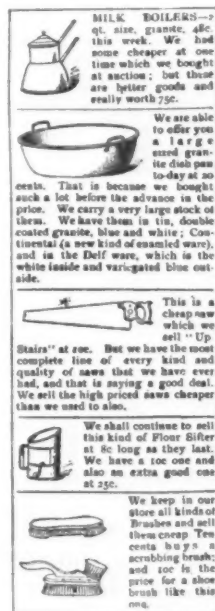


Fig. 1.—Portion of Advertisement (Reduced).

Doxsee's Monday Helpers.

4 things that are necessary to make that day's work a little lighter—to prevent in a measure that "blue feeling" which is encouraged by poor washing utensils. A **GOOD WRINGER** is a cheap wringer. It is not only more durable, but ours with pure soft rubber rolls wrings dry and saves the buttons. We warrant it also for a period of five years, giving you a warranty tag with every wringer. The price can be touched by anyone.



\$4.00

We have cheaper wringers at \$1.50 if you want that kind.

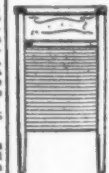


No Leaks in our best Charcoal Tin BOILERS. They are made to wear and do wear. As in everything else we aim to give our customers the best boilers we can buy at reasonable prices. We have the 68 cent kind. If that is what you must have, but a comparison will convince you that the best is the cheapest. We carry a nice assortment of copper boilers, too. Possibly you have a good copper boiler that requires a new bottom; bring it in; we can make it as good as new.



No Hoops to drop off when you have a galvanized steel tub. You can leave it out in the sun and weather and it will not rust or go to pieces. With our wringer attachment any wringer can be used on it.

Prices range from..... 65c up



Improved Wash Boards are being added to our stock from time to time. At present we have one made of galvanized steel, wash board on either side; nothing about it rust or corrode. Price is..... 40c. Cheaper ones at 15c.

C. M. DOXSEE, Hardware

Fig. 2.—Advertisement (Reduced).

that will attract attention, and get the utmost out of his space.


I am glad to get these cuts at so small a cost, and shall find use for more in the near future.



Fig. 3.—Small Advertisement (Reduced).

STRIKING.—The advertisement shown in Fig. 3 was $3\frac{1}{2} \times 7\frac{1}{2}$ inches in size, using Cuts Nos. 584, 559, 504 and 505. The amount of blank space in the advertisement adds largely to its attractive appearance. The number of illustrations used in a comparatively small space without giving a crowded appearance to the advertisement indicates the value of small cuts.

DIFFERENT PURPOSES.—The Cut No 13, shown in Fig.



Don't Care

What the other fellow says.

Our guarantee on "Hammar Paint" not to crack, blister, peel or chalk off for 5 years always stands good, whether your painter puts it on by the day or job, and it only costs you \$1.25 per gallon. No other paint concern in the world give this guarantee. Sold only by

W. E. BOSLEY & SON.

P. S.—We figure Pure Linseed Oil at 60c gallon.

After using Misch Paint or White Lead and it proves worthless, you will not get the same deal the boy does in this picture.

Fig. 4.—Postal Card (Reduced).

4, is one of a class that can be used in a variety of ways. In this instance it was printed on postal cards and enforced the advantages to be derived from using the Mixed Paints handled by a certain Hardware firm.

SUMMER NECESSITIES.—Fig. 5, with Cuts Nos. 584 and 516, shows an advertisement a column wide and about 3 inches long. Finch Bros. state that cuts when rightly employed are half the ad., for an advertisement, if not attractive nowadays, is sure to be overlooked.

GENERAL CUTS.—Cut no. 36, illustrated in Fig. 6, is another that can be used for a variety of purposes. It was used as here shown on a postal card, printed in red ink. This cut has also been used in newspaper advertising.



You're the fellow we're after.

We want your Hardware and Furniture trade. If Low Prices and Fair dealing will catch you, you had better look out.

Watson Hardware Co.
Hamburg, Arkansas.

Fig. 6.—Postal Card (Reduced).

ILLUSTRATED CIRCULARS OF ADVERTISING CUTS.

We have circulars describing the full line of Advertising Cuts which we are offering for the use of Hardware merchants. These cuts are of two general classes:

Pictorial Cuts, for the most part relating to special lines of goods. Examples of these (reduced in size) are shown in Figs. 4 and 6, given herewith.

Outline Cuts, representing separate Hardware articles in frequent sale. These cuts are made of small size so as to permit the use of several in an advertisement without occupying too much space. Some of these cuts are shown (reduced in size) in Figs. 1, 2, 3 and 5, given herewith, and others, full size, are illustrated on preceding page.

Circulars, fully illustrated, with prices of cuts will be sent on application to

DAVID WILLIAMS COMPANY,
232-238 William Street, New York.

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Current Hardware Prices.

REVISED JULY 31, 1900.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, 1/2 doz. \$3.00. 89 1/2 doz. \$1.10
North's 1/2 doz. \$3.00. 10 1/2 doz. \$1.10
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent. 25 1/2 doz. \$1.10
Taplin's Perfection. 50 1/2 doz. \$1.10

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvil. 7 1/2 doz. \$1.10
Hay-Budden, Wrought. 9 1/2 doz. \$1.10
Horsehoe brand, Wrought. 9 1/2 doz. \$1.10
Samson. 7 1/2 doz. \$1.10
Trenton, Wrought. 8 1/2 doz. \$1.10
Buel Pat. Trenton. 8 1/2 doz. \$1.10
Vulcan. 8 1/2 doz. \$1.10

Imported—

Armstrong's Mouse Hole. 8 1/2 doz. \$1.10
Peter Wright's. 9 1/2 doz. \$1.10

Anvil, Vise and Drill—

Millers Falls Co., \$18.00. 20 1/2 doz. \$1.10

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths—

Hull & Hoyt Co. 25 1/2 doz. \$1.10

Small Lots. 20 1/2 doz. \$1.10

Large Lots. 30 1/2 doz. \$1.10

Augers and Bits—

Common Double Spur. 60 1/2 doz. \$1.10

Boring Machine Augers. 60 1/2 doz. \$1.10

Car Bits, 1/2 in. twist. 60 1/2 doz. \$1.10

Jennings' Pattern. 60 1/2 doz. \$1.10

Auger Bits. 60 1/2 doz. \$1.10

Ford's Auger and Car Bits. 40 1/2 doz. \$1.10

Forster Pat. Auger Bits. 20 1/2 doz. \$1.10

C. E. Jennings & Co. 20 1/2 doz. \$1.10

No. 10 ext. lip. R. Jennings' list. 40 1/2 doz. \$1.10

No. 30. R. Jennings' list. 40 1/2 doz. \$1.10

Russell Jennings. 20 1/2 doz. \$1.10

L'Hommedieu Car Bits. 15 1/2 doz. \$1.10

Pugh's Black. 20 1/2 doz. \$1.10

Pugh's Jennings' Pattern. 35 1/2 doz. \$1.10

Small's Auger Bits. 60 1/2 doz. \$1.10

Small's Bell Hangers' Bits. 60 1/2 doz. \$1.10

Small's Car Bits, 1/2 in. twist. 60 1/2 doz. \$1.10

Wright's Jennings Bits (R. Jennings' list). 50 1/2 doz. \$1.10

Bit Stock Drills—

Standard list. 65 1/2 doz. \$1.10

Expansive Bits—

Clark's small, 1/16; large, \$20. 50 1/2 doz. \$1.10

Lavigne's Clark's Pattern, No. 1. 50 1/2 doz. \$1.10

Stear's No. 1, \$30; No. 2, \$15. 40 1/2 doz. \$1.10

Swan's. 30 1/2 doz. \$1.10

Gimlet Bits—

Common Double Cut, gro. \$3.75 to \$5.25

German Pattern, gro. \$5.00 to \$5.50

Double Cut, makers' lists. 60 1/2 doz. \$1.10

Hollow Augers—

Ames. 25 1/2 doz. \$1.10

Bonney's Adjustable, 1/2 doz. \$16.00

New Patent. 25 1/2 doz. \$1.10

Universal. 30 1/2 doz. \$1.10

Ship Augers and Bits—

Ford's. 40 1/2 doz. \$1.10

Buell's. 40 1/2 doz. \$1.10

L'Hommedieu's. 15 1/2 doz. \$1.10

Watrous's. 40 1/2 doz. \$1.10

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:

Handled. gro. \$3.75 to \$5.10

Unhandled, Shouldered, gro. \$3.75 to \$5.10

Unhandled, Patent. gro. \$3.75 to \$5.10

Peg Awls:

Unhandled, Patent. gro. \$3.75 to \$5.10

Unhandled, Shouldered, gro. \$3.75 to \$5.10

Scratch Awls:

Handled, Common. gro. \$3.75 to \$5.10

Handled, Socket. gro. \$3.75 to \$5.10

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First Quality, best brands. \$6.25 to \$6.50

First Quality, other brands. \$6.00 to \$6.25

Jobbers' Special Brands: \$5.00 to \$5.50

Good Quality. \$5.00 to \$5.50

Best Quality. \$5.00 to \$5.50

Cheap, Handled Axes. \$5.50 to \$5.75
Beveled, add 25c doz.

Axle Grease—See Grease, Axle.

Axles—

Concord, loose collar. Iron. Steel. 6 1/2 doz. \$1.10

Concord, solid collar. 6 1/2 doz. \$1.10

No. 1 Common. 5 1/2 doz. \$1.10

No. 1 1/2 Com. New Style. 5 1/2 doz. \$1.10

No. 2 Solid Collar. 5 1/2 doz. \$1.10

Nos. 7, 8, 11 to 14. 50 1/2 doz. \$1.10

Nos. 7, 8, 11 to 14, 100 sets. 50 1/2 doz. \$1.10

Nos. 15 to 18. 50 1/2 doz. \$1.10

Nos. 19 to 22. 50 1/2 doz. \$1.10

Boxes, Axle—

Common and Concord, not turned. 15 1/2 doz. \$1.10

Common and Concord, turned. 15 1/2 doz. \$1.10

Half Patent. 15 1/2 doz. \$1.10

Balances—

Caldwell new list. 50 1/2 doz. \$1.10

Pollman's. 62 1/2 doz. \$1.10

Spring—

Spring Balances. 50 1/2 doz. \$1.10

Chatillon's Light Spg. Balances. 40 1/2 doz. \$1.10

Chatillon Straight Balances. 40 1/2 doz. \$1.10

Chatillon Circular Balances. 50 1/2 doz. \$1.10

Chatillon's Large Dial. 30 1/2 doz. \$1.10

P. 10 1/2 doz. \$1.10

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 14 lb., per lb. 3 1/2 doz. \$1.10

Beams, Scale—

Scale Beams, List Jan. 12, '98. 30 1/2 doz. \$1.10

Chatillon's No. 1. 30 1/2 doz. \$1.10

Chatillon's No. 2. 30 1/2 doz. \$1.10

Beaters—

Standard Co.:

No. 5 Steel Handle Dover. 1/2 doz. \$5.50

No. 10 Cast Handle Dover. 1/2 doz. \$5.00

No. 15 Extra Heavy Dover. 1/2 doz. \$5.00

Rival, 1/2 doz. \$11.00

Taplin Mfg. Co.:

No. 50 Small Family size. 1/2 doz. \$5.50

No. 100 Regular Family size. 1/2 doz. \$5.50

No. 102 Regular Family size, tinned. 1/2 doz. \$5.50

No. 150 Large Family size. 1/2 doz. \$11.00

Lyons's, Standard size. 1/2 doz. \$1.75

Wonder (S. S. & Co.). 1/2 doz. \$7.50

Bellows—

Blacksmith—

Standard list. 70 1/2 doz. \$1.10

Inch. 30 32 34 36 38 40

Each. \$3.70 3.95 4.25 4.50 4.75 5.00

Extra Length:

Each. \$4.25 4.50 4.75 5.00 5.25 5.50

Molders—

Inch. 9 10 11 12 14 16

Doz. \$6.75 7.25 8.50 9.50 11.00 12.50

Hand—

Inch. 6 7 8 9 10 12

Doz. \$3.75 4.25 4.50 5.00 5.75 6.75

Bells—

Ordinary goods. 75 1/2 doz. \$1.10

High grade. 70 1/2 doz. \$1.10

Jersey. 75 1/2 doz. \$1.10

Texas Star. 50 1/2 doz. \$1.10

Door—

Barton G'ng. 55 1/2 doz. \$1.10

Gong, Yankee. 55 1/2 doz. \$1.10

Home, R. & E. Mfg. Co.'s. 50 1/2 doz. \$1.10

Lever and Pull, Sargent & Co. 50 1/2 doz. \$1.10

Hand—

Hand Bells, Polished. 55 1/2 doz. \$1.10

White Metal. 55 1/2 doz. \$1.10

Nickel Plated. 50 1/2 doz. \$1.10

Swiss. 50 1/2 doz. \$1.10

Miscellaneous—

Farm Bells. 1/2 doz. \$1.10

Steel Alloy Church and School. 50 1/2 doz. \$1.10

Wilmot & Hobbs Mfg. Co., Gong. 70 1/2 doz. \$1.10

Belting

Rubber—

Common Standard. 70 1/2 doz. \$1.10

Standard. 60 1/2 doz. \$1.10

Extra. 60 1/2 doz. \$1.10

High Grade. 60 1/2 doz. \$1.10

Leather—

Extra Heavy, Short Lap. 50 1/2 doz. \$1.10

Regular Short Lap. 60 1/2 doz. \$1.10

Standard. 60 1/2 doz. \$1.10

Light Standard. 70 1/2 doz. \$1.10

Cotton—

Rossendale-Rodaway B. & H. Co.:

Sphinx Brand. 80 1/2 doz. \$1.10

Durable Bran 1. 70 1/2 doz. \$1.10

Bench Stops—See Stops, Bench

Benders and Upsetters,

Tire—

Green River Tire Benders and Upsetters. 20 1/2 doz. \$1.10

Ill. Iron & Bolt Co. 45 1/2 doz. \$1.10

Stoddard's Lightning Tire Upsetters. 40 1/2 doz. \$1.10

Bicycle Goods—

Lane's Cycle Hanger. 33 1/2 doz. \$1.10

John S. Long's Son's 1899 list:

Chairs. 50 1/2 doz. \$1.10

Parts. 50 1/2 doz. \$1.10

Spokes. 50 1/2 doz. \$1.10

Tube. 60 1/2 doz. \$1.10

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—

See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Ad-

justers, Blind.

Blind Fasteners—See Fas-

teners, Blind.

Blind Staples—See Staples,

Blind.

Blocks—Tackle—

Common Wooden. 70 1/2 doz. \$1.10

Clevis and Steel. 50 1/2 doz. \$1.10

Eddy's Steel. 60 1/2 doz. \$1.10

Hartz Steel. 50 1/2 doz. \$1.10

Ford's Star Brand Self Lubricating. 60 1/2 doz. \$1.10

Hollow Steel, Ford's Pat. Star Brand. 50 1/2 doz. \$1.10

Lane's Patent Automatic Lock and Junior. 30 1/2 doz. \$1.10

Stowell's Novelty, Mail Iron. 50 1/2 doz. \$1.10

See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c. 60 1/2 doz. \$1.10

Boils—

Carriage, Machine &c.—

Common, list Jan. 30, '98. 70 1/2 doz. \$1.10

Norway Iron, \$3.00, list Oct. 7, '98. 75 1/2 doz. \$1.10

Phila. Eagle, \$3.00 list May 24, '99. 80 1/2 doz. \$1.10

Best Ends, list Jan. 30, '98. 70 1/2 doz. \$1.10

Machine, list Oct. 1, '99. 75 1/2 doz. \$1.10

NOTE.—Jobbers' prices on Boils are now often lower than manufacturers', and the market is irregular.

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch. 3 4 5 6 8

B. L. Caps (Sturtevant Shells) \$1.00
All other primers.....\$1.10@1.18

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Col. Ball Sngd....\$1.30
B. B. Caps, Round Ball...\$1.12@1.18
Blank Cartridges:
38 C. F. \$7.00.....10¢5¢
38 cal. Rim, \$1.50.....10¢5¢
38 cal. Rim, \$2.75.....10¢5¢
Central Fire.....25¢
Pistol and Rifle.....15¢5¢
Primed Shells and Bullets.....15¢5¢
Rim Fire Sporting.....50¢
Rim Fire, Military.....15¢5¢

Casters—

Bed.....60¢10¢10¢70¢
Plate.....60¢10¢10¢10¢5¢
Philadelphia.....70¢10¢10¢10¢
Boss.....70¢10¢
Ross Anti-Friction.....70¢10¢
Martin's Patent (Phoenix).....45¢
Payson's Anti-Friction Furniture.....70¢10¢
Payson's Anti-Friction Truck.....70¢10¢
Standard Ball Bearing.....45¢
Tucker's Patent, low list.....80¢

Cattle Leaders—

See Leaders, Cattle.

Chain—

American Coil, Full Coils:
3-16 1/4 5-16 3/4 7-16 1/2 9-16 3/4
7-90 6-00 5-00 4-15 4-00 3-90 4-50
1/4 1/2 1 1 1/2
5-70 5-55 5-55 5-55 cents per lb.
Less than Cast lots add 10¢ per 100 lbs.
German Coil, list July 24, '97.....
60¢10¢10¢

German Hatter Chain, list July 24, '97.....
60¢10¢10¢

Traces, Western Standard: 100 pair
6-1/2—6-3/4, Straight, with ring.....\$27.00
6-1/2—6-3/4, Straight, with ring.....\$31.00
6-1/2—6-3/4, Straight, with ring.....\$35.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than
Straight Link.

Trace, Wagon and Fancy Chains.
list April, '98.....50¢10¢60¢

Jack Chain, list July 10, '98.....
60¢10¢10¢

Iron.....60¢10¢10¢
Brass.....60¢10¢10¢
Safety Chain.....60¢10¢10¢
Gal. Pump Chain.....1/2 50¢5¢4¢
Breast, Hitching and Rein Chains.
Covert Sad. Works.....50¢
Covert Mfg. Co.:
Breast.....35¢2¢
Halter.....35¢2¢
Heel.....35¢2¢
Rein.....35¢2¢
Stallion.....35¢2¢
Onela Community:
Eureka Coal and Halter.....60¢10¢5¢
Niagara Coal and Halter.....60¢10¢5¢
Niagara Coal Ties.....45¢5¢10¢5¢
Am. Coal and Halters.....50¢10¢5¢
Am. Cow Ties.....35¢5¢40¢5¢
Wire Goods Co.:
Dog Chain.....60¢
Universal Dog-Jointed Chain.....45¢

Chalk—(From Jobbers.)

Carpenters', Blue.....gro. 15¢
Carpenters', Red.....gro. 35¢
Carpenters', White.....gro. 30¢
See also Carbons.

Chalk Lines—See Lines.

Checks, Door—

Bardley's.....40¢10¢
Columbia.....40¢10¢
Eclipse.....50¢60¢10¢

Chisels—

Socket Framing and Firmer
Standard List.....70¢10¢
Buck Bros.....30¢
Charles Buck.....30¢
Swan's.....30¢
L. & J. White.....30¢30¢5¢

Tanged—

Tanged Firmers.....10¢5¢10¢10¢
Buck Bros.....30¢
Charles Buck.....30¢
L. & J. White, Tanged.....25¢5¢

Cold—

Cold Chisels, good quality, lb. 1/2 lb. 1 lb. 2 lb. 3 lb. 4 lb. 5 lb. 6 lb. 7 lb. 8 lb. 9 lb. 10 lb. 11 lb. 12 lb. 13 lb. 14 lb. 15 lb. 16 lb. 17 lb. 18 lb. 19 lb. 20 lb. 21 lb. 22 lb. 23 lb. 24 lb. 25 lb. 26 lb. 27 lb. 28 lb. 29 lb. 30 lb. 31 lb. 32 lb. 33 lb. 34 lb. 35 lb. 36 lb. 37 lb. 38 lb. 39 lb. 40 lb. 41 lb. 42 lb. 43 lb. 44 lb. 45 lb. 46 lb. 47 lb. 48 lb. 49 lb. 50 lb. 51 lb. 52 lb. 53 lb. 54 lb. 55 lb. 56 lb. 57 lb. 58 lb. 59 lb. 60 lb. 61 lb. 62 lb. 63 lb. 64 lb. 65 lb. 66 lb. 67 lb. 68 lb. 69 lb. 70 lb. 71 lb. 72 lb. 73 lb. 74 lb. 75 lb. 76 lb. 77 lb. 78 lb. 79 lb. 80 lb. 81 lb. 82 lb. 83 lb. 84 lb. 85 lb. 86 lb. 87 lb. 88 lb. 89 lb. 90 lb. 91 lb. 92 lb. 93 lb. 94 lb. 95 lb. 96 lb. 97 lb. 98 lb. 99 lb. 100 lb. 101 lb. 102 lb. 103 lb. 104 lb. 105 lb. 106 lb. 107 lb. 108 lb. 109 lb. 110 lb. 111 lb. 112 lb. 113 lb. 114 lb. 115 lb. 116 lb. 117 lb. 118 lb. 119 lb. 120 lb. 121 lb. 122 lb. 123 lb. 124 lb. 125 lb. 126 lb. 127 lb. 128 lb. 129 lb. 130 lb. 131 lb. 132 lb. 133 lb. 134 lb. 135 lb. 136 lb. 137 lb. 138 lb. 139 lb. 140 lb. 141 lb. 142 lb. 143 lb. 144 lb. 145 lb. 146 lb. 147 lb. 148 lb. 149 lb. 150 lb. 151 lb. 152 lb. 153 lb. 154 lb. 155 lb. 156 lb. 157 lb. 158 lb. 159 lb. 160 lb. 161 lb. 162 lb. 163 lb. 164 lb. 165 lb. 166 lb. 167 lb. 168 lb. 169 lb. 170 lb. 171 lb. 172 lb. 173 lb. 174 lb. 175 lb. 176 lb. 177 lb. 178 lb. 179 lb. 180 lb. 181 lb. 182 lb. 183 lb. 184 lb. 185 lb. 186 lb. 187 lb. 188 lb. 189 lb. 190 lb. 191 lb. 192 lb. 193 lb. 194 lb. 195 lb. 196 lb. 197 lb. 198 lb. 199 lb. 200 lb. 201 lb. 202 lb. 203 lb. 204 lb. 205 lb. 206 lb. 207 lb. 208 lb. 209 lb. 210 lb. 211 lb. 212 lb. 213 lb. 214 lb. 215 lb. 216 lb. 217 lb. 218 lb. 219 lb. 220 lb. 221 lb. 222 lb. 223 lb. 224 lb. 225 lb. 226 lb. 227 lb. 228 lb. 229 lb. 230 lb. 231 lb. 232 lb. 233 lb. 234 lb. 235 lb. 236 lb. 237 lb. 238 lb. 239 lb. 240 lb. 241 lb. 242 lb. 243 lb. 244 lb. 245 lb. 246 lb. 247 lb. 248 lb. 249 lb. 250 lb. 251 lb. 252 lb. 253 lb. 254 lb. 255 lb. 256 lb. 257 lb. 258 lb. 259 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lb. 635 lb. 636 lb. 637 lb. 638 lb. 639 lb. 640 lb. 641 lb. 642 lb. 643 lb. 644 lb. 645 lb. 646 lb. 647 lb. 648 lb. 649 lb. 650 lb. 651 lb. 652 lb. 653 lb. 654 lb. 655 lb. 656 lb. 657 lb. 658 lb. 659 lb. 660 lb. 661 lb. 662 lb. 663 lb. 664 lb. 665 lb. 666 lb. 667 lb. 668 lb. 669 lb. 670 lb. 671 lb. 672 lb. 673 lb. 674 lb. 675 lb. 676 lb. 677 lb. 678 lb. 679 lb. 680 lb. 681 lb. 682 lb. 683 lb. 684 lb. 685 lb. 686 lb. 687 lb. 688 lb. 689 lb. 690 lb. 691 lb. 692 lb. 693 lb. 694 lb. 695 lb. 696 lb. 697 lb. 698 lb. 699 lb. 700 lb. 701 lb. 702 lb. 703 lb. 704 lb. 705 lb. 706 lb. 707 lb. 708 lb. 709 lb. 710 lb. 711 lb. 712 lb. 713 lb. 714 lb. 715 lb. 716 lb. 717 lb. 718 lb. 719 lb. 720 lb. 721 lb. 722 lb. 723 lb. 724 lb. 725 lb. 726 lb. 727 lb. 728 lb. 729 lb. 730 lb. 731 lb. 732 lb. 733 lb. 734 lb. 735 lb. 736 lb. 737 lb. 738 lb. 739 lb. 740 lb. 741 lb. 742 lb. 743 lb. 744 lb. 745 lb. 746 lb. 747 lb. 748 lb. 749 lb. 750 lb. 751 lb. 752 lb. 753 lb. 754 lb. 755 lb. 756 lb. 757 lb. 758 lb. 759 lb. 760 lb. 761 lb. 762 lb. 763 lb. 764 lb. 765 lb. 766 lb. 767 lb. 768 lb. 769 lb. 770 lb. 771 lb. 772 lb. 773 lb. 774 lb. 775 lb. 776 lb. 777 lb. 778 lb. 779 lb. 780 lb. 781 lb. 782 lb. 783 lb. 784 lb. 785 lb. 786 lb. 787 lb. 788 lb. 789 lb. 790 lb. 791 lb. 792 lb. 793 lb. 794 lb. 795 lb. 796 lb. 797 lb. 798 lb. 799 lb. 800 lb. 801 lb. 802 lb. 803 lb. 804 lb. 805 lb. 806 lb. 807 lb. 808 lb. 809 lb. 810 lb. 811 lb. 812 lb. 813 lb. 814 lb. 815 lb. 816 lb. 817 lb. 818 lb. 819 lb. 820 lb. 821 lb. 822 lb. 823 lb. 824 lb. 825 lb. 826 lb. 827 lb. 828 lb. 829 lb. 830 lb. 831 lb. 832 lb. 833 lb. 834 lb. 835 lb. 836 lb. 837 lb. 838 lb. 839 lb. 840 lb. 841 lb. 842 lb. 843 lb. 844 lb. 845 lb. 846 lb. 847 lb. 848 lb. 849 lb. 850 lb. 851 lb. 852 lb. 853 lb. 854 lb. 855 lb. 856 lb. 857 lb. 858 lb. 859 lb. 860 lb. 861 lb. 862 lb. 863 lb. 864 lb. 865 lb. 866 lb. 867 lb. 868 lb. 869 lb. 870 lb. 871 lb. 872 lb. 873 lb. 874 lb. 875 lb. 876 lb. 877 lb. 878 lb. 879 lb. 880 lb. 881 lb. 882 lb. 883 lb. 884 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lb. 1009 lb. 1010 lb. 1011 lb. 1012 lb. 1013 lb. 1014 lb. 1015 lb. 1016 lb. 1017 lb. 1018 lb. 1019 lb. 1020 lb. 1021 lb. 1022 lb. 1023 lb. 1024 lb. 1025 lb. 1026 lb. 1027 lb. 1028 lb. 1029 lb. 1030 lb. 1031 lb. 1032 lb. 1033 lb. 1034 lb. 1035 lb. 1036 lb. 1037 lb. 1038 lb. 1039 lb. 1040 lb. 1041 lb. 1042 lb. 1043 lb. 1044 lb. 1045 lb. 1046 lb. 1047 lb. 1048 lb. 1049 lb. 1050 lb. 1051 lb. 1052 lb. 1053 lb. 1054 lb. 1055 lb. 1056 lb. 1057 lb. 1058 lb. 1059 lb. 1060 lb. 1061 lb. 1062 lb. 1063 lb. 1064 lb. 1065 lb. 1066 lb. 1067 lb. 1068 lb. 1069 lb. 1070 lb. 1071 lb. 1072 lb. 1073 lb. 1074 lb. 1075 lb. 1076 lb. 1077 lb. 1078 lb. 1079 lb. 1080 lb. 1081 lb. 1082 lb. 1083 lb. 1084 lb. 1085 lb. 1086 lb. 1087 lb. 1088 lb. 1089 lb. 1090 lb. 1091 lb. 1092 lb. 1093 lb. 1094 lb. 1095 lb. 1096 lb. 1097 lb. 1098 lb. 1099 lb. 1100 lb. 1101 lb. 1102 lb. 1103 lb. 1104 lb. 1105 lb. 1106 lb. 1107 lb. 1108 lb. 1109 lb. 1110 lb. 1111 lb. 1112 lb. 1113 lb. 1114 lb. 1115 lb. 1116 lb. 1117 lb. 1118 lb. 1119 lb. 1120 lb. 1121 lb. 1122 lb. 1123 lb. 1124 lb. 1125 lb. 1126 lb. 1127 lb. 1128 lb. 1129 lb. 1130 lb. 1131 lb. 1132 lb. 1133 lb. 1134 lb. 1135 lb. 1136 lb. 1137 lb. 1138 lb. 1139 lb. 1140 lb. 1141 lb. 1142 lb. 1143 lb. 1144 lb. 1145 lb. 1146 lb. 1147 lb. 1148 lb. 1149 lb. 1150 lb. 1151 lb. 1152 lb. 1153 lb. 1154 lb. 1155 lb. 1156 lb. 1157 lb. 1158 lb. 1159 lb. 1160 lb. 1161 lb. 1162 lb. 1163 lb. 1164 lb. 1165 lb. 1166 lb. 1167 lb. 1168 lb. 1169 lb. 1170 lb. 1171 lb. 1172 lb. 1173 lb. 1174 lb. 1175 lb. 1176 lb. 1177 lb. 1178 lb. 1179 lb. 1180 lb. 1181 lb. 1182 lb. 1183 lb. 1184 lb. 1185 lb. 1186 lb. 1187 lb. 1188 lb. 1189 lb. 1190 lb. 1191 lb. 1192 lb. 1193 lb. 1194 lb. 1195 lb. 1196 lb. 1197 lb. 1198 lb. 1199 lb. 1200 lb. 1201 lb. 1202 lb. 1203 lb. 1204 lb. 1205 lb. 1206 lb. 1207 lb. 1208 lb. 1209 lb. 1210 lb. 1211 lb. 1212 lb. 1213 lb. 1214 lb. 1215 lb. 1216 lb. 1217 lb. 1218 lb. 1219 lb. 1220 lb. 1221 lb. 1222 lb. 1223 lb. 1224 lb. 1225 lb. 1226 lb. 1227 lb. 1228 lb. 1229 lb. 1230 lb. 1231 lb. 1232 lb. 1233 lb. 1234 lb. 1235 lb. 1236 lb. 1237 lb. 1238 lb. 1239 lb. 1240 lb. 1241 lb. 1242 lb. 1243 lb. 1244 lb. 1245 lb. 1246 lb. 1247 lb. 1248 lb. 1249 lb. 1250 lb. 1251 lb. 1252 lb. 1253 lb. 1254 lb. 1255 lb. 1256 lb. 1257 lb. 1258 lb. 1259 lb. 1260 lb. 1261 lb. 1262 lb. 1263 lb. 1264 lb. 1265 lb. 1266 lb. 1267 lb. 1268 lb. 1269 lb. 1270 lb. 1271 lb. 1272 lb. 1273 lb. 1274 lb. 1275 lb. 1276 lb. 1277 lb. 1278 lb. 1279 lb. 1280 lb. 1281 lb. 1282 lb. 1283 lb. 1284 lb. 1285 lb. 1286 lb. 1287 lb. 1288 lb. 1289 lb. 1290 lb. 1291 lb. 1292 lb. 1293 lb. 1294 lb. 1295 lb. 1296 lb. 1297 lb. 1298 lb. 1299 lb. 1300 lb. 1301 lb. 1302 lb. 1303 lb. 1304 lb. 1305 lb. 1306 lb. 1307 lb. 1308 lb. 1309 lb. 1310 lb. 1311 lb. 1312 lb. 1313 lb. 1314 lb. 1315 lb. 1316 lb. 1317 lb. 1318 lb. 1319 lb. 1320 lb. 1321 lb. 1322 lb. 1323 lb. 1324 lb. 1325 lb. 1326 lb. 1327 lb. 1328 lb. 1329 lb. 1330 lb. 1331 lb. 1332 lb. 1333 lb. 1334 lb. 1335 lb. 1336 lb. 1337 lb. 1338 lb. 1339 lb. 1340 lb. 1341 lb. 1342 lb. 1343 lb. 1344 lb. 1345 lb. 1346 lb. 1347 lb. 1348 lb. 1349 lb. 1350 lb. 1351 lb. 1352 lb. 1353 lb. 1354 lb. 1355 lb. 1356 lb. 1357 lb. 1358 lb. 1359 lb. 1360 lb. 1361 lb. 1362 lb. 1363 lb. 1364 lb. 1365 lb. 1366 lb. 1367 lb. 1368 lb. 1369 lb. 1370 lb. 1371 lb. 1372 lb. 1373 lb. 1374 lb. 1375 lb. 1376 lb. 1377 lb. 1378 lb. 1379 lb. 1380 lb. 1381 lb. 1382 lb. 1383 lb. 1384 lb. 1385 lb. 1386 lb. 1387 lb. 1388 lb. 1389 lb. 1390 lb. 1391 lb. 1392 lb. 1393 lb. 1394 lb. 1395 lb. 1396 lb. 1397 lb. 1398 lb. 1399 lb. 1400 lb. 1401 lb. 1402 lb. 1403 lb. 1404 lb. 1405 lb. 1406 lb. 1407 lb. 1408 lb. 1409 lb. 1410 lb. 1411 lb. 1412 lb. 1413 lb. 1414 lb. 1415 lb. 1416 lb. 1417 lb. 1418 lb. 1419 lb. 1420 lb. 1421 lb. 1422 lb. 1423 lb. 1424 lb. 1425 lb. 1426 lb. 1427 lb. 1428 lb. 1429 lb. 1430 lb. 1431 lb. 1432 lb. 1433 lb. 1434 lb. 1435 lb. 1436 lb. 1437 lb. 1438 lb. 1439 lb. 1440 lb. 1441 lb. 1442 lb. 1443 lb. 1444 lb. 1445 lb. 1446 lb. 1447 lb. 1448 lb. 1449 lb. 1450 lb. 1451 lb. 1452 lb. 1453 lb. 1454 lb. 1455 lb. 1456 lb. 1457 lb. 1458 lb. 1459 lb. 1460 lb. 1461 lb. 1462 lb. 1463 lb. 1464 lb. 1465 lb. 1466 lb. 1467 lb. 1468 lb. 1469 lb. 1470 lb. 1471 lb. 1472 lb. 1473 lb. 1474 lb. 1475 lb. 1476 lb. 1477 lb. 1478 lb. 1479 lb. 1480 lb. 1481 lb. 1482 lb. 1483 lb. 1484 lb. 1485 lb. 1486 lb. 1487 lb. 1488 lb. 1489 lb. 1490 lb. 1491 lb. 1492 lb. 1493 lb. 1494 lb. 1495 lb. 1496 lb. 1497 lb. 1498 lb. 1499 lb. 1500 lb. 1501 lb. 1502 lb. 1503 lb. 1504 lb. 1505 lb. 1506 lb. 1507 lb. 1508 lb. 1509 lb. 1510 lb. 1511 lb. 1512 lb. 1513 lb. 1514 lb. 1515 lb. 1516 lb. 1517 lb. 1518 lb. 1519 lb. 1520 lb. 1521 lb. 1522 lb. 1523 lb. 1524 lb. 1525 lb. 1526 lb. 1527 lb. 1528 lb. 1529 lb. 1530 lb. 1531 lb. 1532 lb. 1533 lb. 1534 lb. 1535 lb. 1536 lb. 1537 lb. 1538 lb. 1539 lb. 1540 lb. 1541 lb. 1542 lb. 1543 lb. 1544 lb. 1545 lb. 1546 lb. 1547 lb. 1548 lb. 1549 lb. 1550 lb. 1551 lb. 1552 lb. 1553 lb. 1554 lb. 1555 lb. 1556 lb. 1557 lb. 1558 lb. 1559 lb. 1560 lb. 1561 lb. 1562 lb. 1563 lb. 1564 lb. 1565 lb. 1566 lb. 1567 lb. 1568 lb. 1569 lb. 1570 lb. 1571 lb. 1572 lb. 1573 lb. 1574 lb. 1575 lb. 1576 lb. 1577 lb. 1578 lb. 1579 lb. 1580 lb. 1581 lb. 1582 lb. 1583 lb. 1584 lb. 1585 lb. 1586 lb. 1587 lb.

Climlets—
 Nail, Metal, Assorted, gro. \$1.40@1.75
 Spike, Metal, Assorted, gro. \$3.00@3.50
 Nail, Wood Handled, Assorted, gro. \$4.00@4.25
 Spike, Wood Handled, Assorted, gro. \$5.00@5.25
Class, American Window
 List Jan 1, 1898.

Small lots from store:
 Single, Eastern.....85%
 First Bracket.....85%
 Second and Third Brackets.....85%
 Eastern, All Other Brackets.....85%
 Double, Eastern.....85%
 First Bracket.....85%
 Second, Third, Fourth and Fifth Brackets.....85%
 All Other Brackets.....85%
 From Jobbers or Factory, with Freight Allowance, except in Eastern district:
 Carloads, Single Strength.....85%
 First Bracket.....85%
 Second and Third Brackets.....85%
 All Above.....85%
 Carloads, Double Strength.....85%
 First Five Brackets.....85%
 60 inch Bracket.....85%
 70 to 100 inch Bracket, inclusive.....85%
 All Above.....85%

Clue—Liquid, Fish—
 List A, Bottles or Cans, with Brush.....87%
 List B, Cans (1/2 pts., pts., qts.).....85%
 List C, Cans (1/2 gal., gal.).....85%

Clue Pots—See Pots, Glue.
Grease, Axle—
 Common Grade.....gro. \$5.00@5.00
 Dixon's Everlasting.....10-15 pails, ea. 85¢
 Dixon's Everlasting, in bxs. 1 doz. 1.....\$1.20; 2 doz. \$2.00

Snow Flake
 1 qt. cans, per doz. \$2.00; 2 qt. \$3.00; 1 al. cans per doz. \$3.00;
 3 gal. \$10.00; 5 gal. \$24.00.

Grindstone Fixtures—
 See Fixtures, Grindstone.
Guards, Snow—
 Cleveland Wire Spring Co.:
 Galv. St. 1000.....\$0.00
 Copper 1000.....\$18.00

Cun Powder—See Powder.
Hack Saws—See Saws.
Hafts, Awi—
 gro.

Patent, Leather Top.....\$4.90@5.25
Patent, Plain Top.....\$3.50@3.75
 Sewing, Brass Ferrule.....\$1.50@1.60
 Saddlers', Brass Ferrule.....\$1.35@1.45
 Peg, Common.....\$1.25@1.35
 Brad, Common.....\$1.50@1.75

Halters and Ties—
 Covert Mfg. Co., Web.....45¢
 Covert Mfg. Co., Jute Rope.....45¢
 Covert Mfg. Co., Sisal Rope.....30¢
 Covert's Saddlery Works, 99 list, Web.....60¢
 Covert's Saddlery Works, Leather.....60¢
 Covert's Saddlery Works, Jute.....60¢
 Covert's Saddlery Works, Sisal.....60¢
 Covert's Saddlery Works, Manila.....60¢
 Covert's Saddlery Works, Cotton.....70¢

Hammers—
Handled Hammers—
 Heller's Machinists.....50¢
 Heller's Farriers.....50¢
 Magisto Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Heavy Hammers and Sledges—
 1 lb. and under.....lb. 45¢
 5 to 10 lb.....lb. 35¢
 Over 10 lb.....lb. 30¢
 Wilkinson's Smiths.....95¢@1.00 lb.

Handcuffs and Leg Irons—
 See Police Goods.
Handles—
Agricultural Tool Handles—
 Hoe, Rake, Fork, etc.....50¢@1.00
 Shovel, etc., Wood D Handle.....50¢@1.00

Cross-Cut Saw Handles—
 Atkins.....40¢
 Champion.....45¢
 Disston.....50¢

Mechanics' Tool Handles—
 Assorted.....gro. \$2.00@2.50
 Assorted, large.....gro. \$2.50@3.00
 Broad Axl.....gro. \$1.50@1.75

Chisel Handles—
 Apple Tanged Firmer, gro. ass'd.....\$2.50@3.50
 Hickory Tanged Firmer, gro. ass'd.....\$1.75@2.25
 Apple Socket Firmer, gro. ass'd.....\$1.75@2.00
 Hickory Socket Firmer, gro. ass'd.....\$1.75@2.00
 Hickory Socket Framing, gro. ass'd.....\$2.00@2.50
 Assorted.....gro. \$1.00@1.15
 Hammer, Hatchet, Axe, etc.....40¢
 Broad Saw, Parnished, doz. 75¢
 Parnished.....55¢@80¢
 Handles.....doz. 25¢@35¢; Jack Bolted.....55¢@80¢
 Fore, Bolted.....70¢@75¢

Hangers—
 Barn Door, New Pattern, Round Groove, Regular:
 1/2 inch.....\$1.10 1/4 1/2 3/4 1 1 1/2 1 3/4 2 2 1/2 3 3 1/2 4 4 1/2 5 5 1/2 6 6 1/2 7 7 1/2 8 8 1/2 9 9 1/2 10 10 1/2 11 11 1/2 12 12 1/2 13 13 1/2 14 14 1/2 15 15 1/2 16 16 1/2 17 17 1/2 18 18 1/2 19 19 1/2 20 20 1/2 21 21 1/2 22 22 1/2 23 23 1/2 24 24 1/2 25 25 1/2 26 26 1/2 27 27 1/2 28 28 1/2 29 29 1/2 30 30 1/2 31 31 1/2 32 32 1/2 33 33 1/2 34 34 1/2 35 35 1/2 36 36 1/2 37 37 1/2 38 38 1/2 39 39 1/2 40 40 1/2 41 41 1/2 42 42 1/2 43 43 1/2 44 44 1/2 45 45 1/2 46 46 1/2 47 47 1/2 48 48 1/2 49 49 1/2 50 50 1/2 51 51 1/2 52 52 1/2 53 53 1/2 54 54 1/2 55 55 1/2 56 56 1/2 57 57 1/2 58 58 1/2 59 59 1/2 60 60 1/2 61 61 1/2 62 62 1/2 63 63 1/2 64 64 1/2 65 65 1/2 66 66 1/2 67 67 1/2 68 68 1/2 69 69 1/2 70 70 1/2 71 71 1/2 72 72 1/2 73 73 1/2 74 74 1/2 75 75 1/2 76 76 1/2 77 77 1/2 78 78 1/2 79 79 1/2 80 80 1/2 81 81 1/2 82 82 1/2 83 83 1/2 84 84 1/2 85 85 1/2 86 86 1/2 87 87 1/2 88 88 1/2 89 89 1/2 90 90 1/2 91 91 1/2 92 92 1/2 93 93 1/2 94 94 1/2 95 95 1/2 96 96 1/2 97 97 1/2 98 98 1/2 99 99 1/2 100 100 1/2 101 101 1/2 102 102 1/2 103 103 1/2 104 104 1/2 105 105 1/2 106 106 1/2 107 107 1/2 108 108 1/2 109 109 1/2 110 110 1/2 111 111 1/2 112 112 1/2 113 113 1/2 114 114 1/2 115 115 1/2 116 116 1/2 117 117 1/2 118 118 1/2 119 119 1/2 120 120 1/2 121 121 1/2 122 122 1/2 123 123 1/2 124 124 1/2 125 125 1/2 126 126 1/2 127 127 1/2 128 128 1/2 129 129 1/2 130 130 1/2 131 131 1/2 132 132 1/2 133 133 1/2 134 134 1/2 135 135 1/2 136 136 1/2 137 137 1/2 138 138 1/2 139 139 1/2 140 140 1/2 141 141 1/2 142 142 1/2 143 143 1/2 144 144 1/2 145 145 1/2 146 146 1/2 147 147 1/2 148 148 1/2 149 149 1/2 150 150 1/2 151 151 1/2 152 152 1/2 153 153 1/2 154 154 1/2 155 155 1/2 156 156 1/2 157 157 1/2 158 158 1/2 159 159 1/2 160 160 1/2 161 161 1/2 162 162 1/2 163 163 1/2 164 164 1/2 165 165 1/2 166 166 1/2 167 167 1/2 168 168 1/2 169 169 1/2 170 170 1/2 171 171 1/2 172 172 1/2 173 173 1/2 174 174 1/2 175 175 1/2 176 176 1/2 177 177 1/2 178 178 1/2 179 179 1/2 180 180 1/2 181 181 1/2 182 182 1/2 183 183 1/2 184 184 1/2 185 185 1/2 186 186 1/2 187 187 1/2 188 188 1/2 189 189 1/2 190 190 1/2 191 191 1/2 192 192 1/2 193 193 1/2 194 194 1/2 195 195 1/2 196 196 1/2 197 197 1/2 198 198 1/2 199 199 1/2 200 200 1/2 201 201 1/2 202 202 1/2 203 203 1/2 204 204 1/2 205 205 1/2 206 206 1/2 207 207 1/2 208 208 1/2 209 209 1/2 210 210 1/2 211 211 1/2 212 212 1/2 213 213 1/2 214 214 1/2 215 215 1/2 216 216 1/2 217 217 1/2 218 218 1/2 219 219 1/2 220 220 1/2 221 221 1/2 222 222 1/2 223 223 1/2 224 224 1/2 225 225 1/2 226 226 1/2 227 227 1/2 228 228 1/2 229 229 1/2 230 230 1/2 231 231 1/2 232 232 1/2 233 233 1/2 234 234 1/2 235 235 1/2 236 236 1/2 237 237 1/2 238 238 1/2 239 239 1/2 240 240 1/2 241 241 1/2 242 242 1/2 243 243 1/2 244 244 1/2 245 245 1/2 246 246 1/2 247 247 1/2 248 248 1/2 249 249 1/2 250 250 1/2 251 251 1/2 252 252 1/2 253 253 1/2 254 254 1/2 255 255 1/2 256 256 1/2 257 257 1/2 258 258 1/2 259 259 1/2 260 260 1/2 261 261 1/2 262 262 1/2 263 263 1/2 264 264 1/2 265 265 1/2 266 266 1/2 267 267 1/2 268 268 1/2 269 269 1/2 270 270 1/2 271 271 1/2 272 272 1/2 273 273 1/2 274 274 1/2 275 275 1/2 276 276 1/2 277 277 1/2 278 278 1/2 279 279 1/2 280 280 1/2 281 281 1/2 282 282 1/2 283 283 1/2 284 284 1/2 285 285 1/2 286 286 1/2 287 287 1/2 288 288 1/2 289 289 1/2 290 290 1/2 291 291 1/2 292 292 1/2 293 293 1/2 294 294 1/2 295 295 1/2 296 296 1/2 297 297 1/2 298 298 1/2 299 299 1/2 300 300 1/2 301 301 1/2 302 302 1/2 303 303 1/2 304 304 1/2 305 305 1/2 306 306 1/2 307 307 1/2 308 308 1/2 309 309 1/2 310 310 1/2 311 311 1/2 312 312 1/2 313 313 1/2 314 314 1/2 315 315 1/2 316 316 1/2 317 317 1/2 318 318 1/2 319 319 1/2 320 320 1/2 321 321 1/2 322 322 1/2 323 323 1/2 324 324 1/2 325 325 1/2 326 326 1/2 327 327 1/2 328 328 1/2 329 329 1/2 330 330 1/2 331 331 1/2 332 332 1/2 333 333 1/2 334 334 1/2 335 335 1/2 336 336 1/2 337 337 1/2 338 338 1/2 339 339 1/2 340 340 1/2 341 341 1/2 342 342 1/2 343 343 1/2 344 344 1/2 345 345 1/2 346 346 1/2 347 347 1/2 348 348 1/2 349 349 1/2 350 350 1/2 351 351 1/2 352 352 1/2 353 353 1/2 354 354 1/2 355 355 1/2 356 356 1/2 357 357 1/2 358 358 1/2 359 359 1/2 360 360 1/2 361 361 1/2 362 362 1/2 363 363 1/2 364 364 1/2 365 365 1/2 366 366 1/2 367 367 1/2 368 368 1/2 369 369 1/2 370 370 1/2 371 371 1/2 372 372 1/2 373 373 1/2 374 374 1/2 375 375 1/2 376 376 1/2 377 377 1/2 378 378 1/2 379 379 1/2 380 380 1/2 381 381 1/2 382 382 1/2 383 383 1/2 384 384 1/2 385 385 1/2 386 386 1/2 387 387 1/2 388 388 1/2 389 389 1/2 390 390 1/2 391 391 1/2 392 392 1/2 393 393 1/2 394 394 1/2 395 395 1/2 396 396 1/2 397 397 1/2 398 398 1/2 399 399 1/2 400 400 1/2 401 401 1/2 402 402 1/2 403 403 1/2 404 404 1/2 405 405 1/2 406 406 1/2 407 407 1/2 408 408 1/2 409 409 1/2 410 410 1/2 411 411 1/2 412 412 1/2 413 413 1/2 414 414 1/2 415 415 1/2 416 416 1/2 417 417 1/2 418 418 1/2 419 419 1/2 420 420 1/2 421 421 1/2 422 422 1/2 423 423 1/2 424 424 1/2 425 425 1/2 426 426 1/2 427 427 1/2 428 428 1/2 429 429 1/2 430 430 1/2 431 431 1/2 432 432 1/2 433 433 1/2 434 434 1/2 435 435 1/2 436 436 1/2 437 437 1/2 438 438 1/2 439 439 1/2 440 440 1/2 441 441 1/2 442 4

Latches, Thumb-
Roggin's Latches..... doz. \$2@3.50

Lawn Mowers-
See Mowers, Lawn.

Leaders, Cattle-
Small..... doz. 45c; large, 55c
Cover Mfg. Co..... 45c@55c

Lemon Squeezers-
See Squeezers, Lemon.

Lifters, Transom-
Dickson:
3 x 4 ft. x 1/2"..... \$100 \$11.00
Other sizes, iron..... 70c@1.00
Other size, Brass and Bronze..... 70c
Excelsior..... 60c@60c@1.00
Payson's:
Solid Grip Nos. 643 and 644, \$1.00
Bronzed Iron..... 70c

Lines-
Wire Clothes, Nos. 18 19 20
100 feet..... \$2.90 \$2.60 1.95
75 feet..... \$2.15 1.90 1.65
Ossawa Mills:
Crown Solid Braided Chalk..... 83c
Mason's, No. 0 to No. 3..... 93c
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3..... 40c
Silver Lake Braided Chalk, No. 0, \$6.00;
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50
\$7.00..... 80c

Locks, &c.- Cabinet-
Cabinet Locks..... 53c@53c@7c

Door Locks, Latches, &c.-
[Net prices are very often made on these goods.]
Reading Hardware Co..... 40c
R. & E. Mfg. Co..... 50c
Sargent & Co..... 40c@40c@1.00
Slaymaker-Barry Co..... 80c@85c
Snow's Victor..... 50c@1.00

Elevator-
Stowell's..... 33c

Padlocks-
Wrought Iron, list Dec. 3, '97..... 70c@70c@1.00
Dog Collar, S. B. Co..... 40c
R. & E. Mfg. Co. Wrt. Steel and Brass..... 50c
R. B. & Co..... 40c

Sash, &c.-
Fitch's Bronze and Brass..... 60c
Fitch's Iron..... 70c
Ives' Patent..... 62c@1.00@60c@1.00
Oeffner's Automatic..... 50c
Payson's Perfect..... 70c
Payson's Signal (new list)..... 75c
Reading..... 60c@1.00@1.00

Machines-
Boring-
Without Augers.
Upright. Angular.
Improved No. 3..... \$4.25 No. 1 \$5.00
Improved No. 4..... 3.75 No. 2 3.38
Improved No. 5..... 2.75
Jennings'..... 2.50 8.00
Miller's Falls..... 6.75
Snell's, Rice's Pat. 2.50 2.75
Swan's, No. 500..... 5.10 No. 200 6.45

Holisting-
Moore's Anti-Friction Differential Pulley Block..... 80c
Moore's Hand Hoist, with Lock Brake..... 30c

Washing-
Wayne American, \$ doz. \$28.00
Western Star, No. 2, \$ doz. 28.00
Western Star, No. 3, \$ doz. 30.00
St. Louis, No. 41, \$ doz. 60.00

Mallets-
Hickory..... 45c@50c@55c
Lignumvite..... 45c@50c@55c
Tinnert's, Hickory and Applewood, \$ doz. 60c@55c
Fiber Head Stearns'..... 80c@1.00

Mats- Door-
Elastic Steel (W. G. Co.)..... 10c

Mattocks-
See Picks and Mattocks.

Meat Cutters-
See Cutters, Meat.

Milk Cans-See Cans, Milk.

Mills- Coffee-
Box and Side, list Jan. 1, '98..... 50c@1.00@60c@55c
Net prices are often made on some goods which are lower than above discounts.
Enterprise Mfg. Co..... 25c@30c
National, list Jan. 1, '94..... 30c
Parker's Columbia and Victoria..... 50c@1.00@60c
Parker's Box and Side..... 50c@1.00@60c
Swift, Lane Bros..... 30c

Mincing Knives-
See Knives, Mincing.

Molasses Gates-
See Gates, Molasses.

Money Drawers-
See Drawers, Money.

Mowers, Lawn-
Net prices are generally quoted.
Cheap..... all sizes, \$2.00
Good..... all sizes, \$2.50@2.75
12 12 16-inch
High Grade 4.25 4.50 4.75 5.00
Pennsylvania and Continental 60c@1.00@55c
Quaker City..... 70c@55c
Great American..... 70c@55c

Philadelphia:
Styles M. S. C. K. T..... 70c@1.00
Style A, all Steel..... 60c@1.00
Style E, Low Wheel..... 60c@1.00
Style E, High Wheel..... 70c@1.00
Drexel and Gold Coin, low list..... 50c

Nails-
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered.
List July 20, 1899..... 85c@95c@1.00
Hungarian, Finishing, Upholsterers, &c. See Tacks

Horse-
Nos. 6 7 8 9 10
A. C..... 25c 25c 25c 21c 21c
Capwell..... 19c 18c 17c 16c 16c@1.00
C. B. K..... 25c 25c 22c 21c 21c
Champlain..... 25c 25c 25c 24c 23c
Maud S..... 25c 25c 23c 21c 21c
Neponset..... 23c 21c 20c 19c 18c
Putnam..... 23c 21c 20c 19c 18c
Standard..... 23c 21c 20c 19c 18c
Star..... 23c 21c 20c 19c 18c
Vulcan..... 23c 21c 20c 19c 18c

Picture
1 1/2 2 3 4 5 in.
Brass Head..... 60 60 70 95 1.00 gro.
Por. Head..... 1.10 1.10 1.10 .. gro.

Nippers, See Pliers and Nippers.
Nut Crackers-
See Crackers, Nut.

Nuts-
List Feb. 1, '99.
Cold Punched Off
Mfrs. or U. S. Standard. list.
Hexagon, plain..... 4.00@4.50
Square, plain..... 4.30@4.40
Square, C. T. & R..... 4.70@4.80
Hexagon, C. T. & R..... 4.70@4.80

Hot Pressed:
Mfrs. U. S. or Nar. Gauge Stan'd.
Square..... 5.20@5.30
Hexagon..... 5.50@5.60
Note.-Tapped Nuts are now 2-10c higher than above.

Oakum-
Best or Government..... lb. 6c
Navy..... lb. 5 c
U. S. Navy..... lb. 5 c
Plumbers' Spun Navy..... 3 c
In carload lots 1/4 lb. off f. o. b. New York.

Oil, Axle-
Snow Flake:
1 pt. cans, per doz..... \$3.00
1 qt. cans, per doz..... \$4.80
1 gal. cans, per doz..... \$15.00
5 gal. cans, per doz..... \$60.00

Oil Tanks-See Tanks, Oil.
Oilers-
Brass and Copper..... 60c@1.00@50c
Tin or Steel..... 60c@1.00@55c
Zinc..... 60c@1.00@55c
Malleable, Hammers' Improved, No. 1, \$3.00; No. 2, \$4; No. 3, \$4.40; No. 4, 20c
Malleable, Hammers' Old Pattern, same list..... 50c@1.00
Wilmet & Hobbs Mfg. Co..... 70c@70c@1.00

Openers-
Can-
French..... doz. 35c
Iron Handle..... doz. 25c@37c
Sprague, Iron Hdle., per doz. 35c@40c
Sardine Scissors..... doz. \$1.75@3.00
Tip Top..... per doz. 30.75
National, \$ gro..... \$1.75@2.00
Stowell's..... per doz. 40c@45c

Egg-
Nickel Plate..... per doz. \$2.00
Silver Plate..... per doz. \$4.00

Packing-
Rubber-
Standard, fair quality..... 70c@1.00@75c
Inferior quality..... 75c@1.00@2.00
Extra..... 60c@60c@1.00
Jenkins' Standard, \$ 50c..... 25c@25c@25c

Miscellaneous-
American Packing..... 9c@10c lb.
Cotton Packing..... 15c@14c lb.
Italian Packing..... 10c@11c lb.
Jute..... 5c@5c lb.
Russia Packing..... 12c@13c lb.

Pails-
Creamery-
S. B. & Co., with gauges. No 1 \$6.50;
No. 2, \$6.75 \$ doz.

Galvanized-
Price per gro.
Inch..... 10 12 14
Water, Regular..... 13.00 11.00 24.00
Water, Heavy..... 21.00 25.00 38.00
Fire, Rd. Bottom..... 21.00 35.00 55.00
Well..... 27.00 29.00 51.00

Pans-
Dripping-
Standard List..... 60c@60c@55c

Fry-
Standard List..... 75c@1.00@90c
Roasting and Baking-
Regal, S. S. & Co., \$ doz. Nos. 5, \$4.50;
10 \$5.00; 20 \$5.50; 30 \$6.00.
Simplex, \$ gro. No. 40, \$30.00; 50, \$34.50; 60 \$39.00; 140, \$33.00; 150, \$37.50; 160, \$43.00.

Paper-
Building Paper-
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light wt., 20 sq. ft. to lb. 50 40c@45c
Medium wt., 12 sq. ft. to lb. 50 40c@45c

Heavy wt., extra quality, 9.95@1.05
Medium Grades Water Proof Sheathing..... 60.80@1.25
Deafening Felt, 9, 6 and 1 1/2 sq. ft. to lb., ton..... \$13.00@45.00
York Haven Waterproof Sheathing..... \$1.35@1.75

Tarred Paper.
1 ply (roll 300 sq. ft.), ton..... \$32.00@37.00
2 ply, roll 100 sq. ft..... 75c
3 ply, roll 100 sq. ft..... \$1.00

Sand and Emery-
List Dec. 23, 1899..... 50c@1.00@50c@1.00
see Trade Report.

Parers- Apple-
Advance..... \$ doz. \$4.50
Baldwin..... \$ doz. \$5.00
Bonanza..... each \$5.00
Dandy..... each \$7.50
Eureka, 1898..... each \$16.00
Family Bay State..... \$ doz. \$12.00
Hudson's Little Star..... \$ doz. \$4.00
Hudson's Rocking Table..... \$ doz. \$5.50
Improved Bay State..... \$ doz. \$27.00@30.00
New Lightning..... \$ doz. \$5.50
Reading 72..... \$ doz. \$4.00
Reading 78..... \$ doz. \$7.00
Turn Table..... \$ doz. \$5.50
White Mountain..... \$ doz. \$4.00

Potato-
Saratoga..... \$ doz. \$5.50
White Mountain..... \$ doz. \$4.50

Picks and Mattocks-
List Feb. 23, 1899..... 65c@65c@1.00

Pinking Irons-
See Irons, Pinking.

Pins-
Escutcheon-
Brass..... 60c@1.00
Iron, list Nov. 11, '95..... 60c@1.00

Pipe, Cast Iron Soil-
Factory Shipments.
Standard, 3-6 in..... 65c@1.00
Extra Heavy, 2-6 in..... 70c
Fittings..... 75c

Pipe, Merchant, Boiler
Tubes, &c.-
Carloads to Consumers.
Merchant Pipe.
Black. Galvanized.
1/4 to 1/2 inch..... 65c 50c
3/4 to 1 inch..... 65c 55c
1 to 1 1/2 inch..... 65c 50c

Boiler Tubes.
Steel. Up to 22 feet and over.
1 to 1 1/2 inch..... 65c 45c
1 1/2 to 2 1/4 inch..... 65c 50c
2 1/2 inch..... 65c 45c
2 1/2 to 3 inch..... 65c 50c

Casing. S. & S.
1 to 2 1/2 inch..... 65c 45c
2 1/2 to 3 inch..... 65c 50c
3 to 4 1/2 inch..... 65c 55c
4 1/2 to 7 1/4 inch..... 65c 60c
7 1/4 inch..... 65c 60c

Planes and Plane Irons-
Wood Planes-
Molding..... 40c@40c@1.00
Bench, First quality..... 40c@40c@1.00
Bench, Second quality..... 40c@40c@1.00
Bailey's (Stanley R. & L. Co.)..... 50c@1.00@50c@1.00
Gage Self Setting..... 35c

Iron Planes-
Bailey's (Stanley R. & L. Co.)..... 50c@1.00@50c@1.00
Chaplin's Iron Planes..... 50c@1.00
Miscellaneous Planes (Stanley R. & L. Co.)..... 25c@1.00@50c@1.00
Sargent's..... 50c@1.00@50c@1.00

Plane Irons-
Wood Bench Plane Irons..... 35c@35c@55c
Buck Bros..... 30c
Butcher's..... 35.00@35.25 to 2
Stanley R. & L. Co..... 50c@1.00@50c@1.00
L. & J. J. White..... 20c@25c@35c

Planters, Corn, Hand.
Kohler's Eclipse..... \$ doz. \$9.00

Plates-
Fibrolac..... lb. 3 1/2 @ 3 1/2
Self-Sealing Pie Plates (S. S. & Co.), \$ doz. \$2.00..... 50c

Pliers and Nippers-
Button Pliers..... 65c@1.00@70c@1.00
Gas Burner, per doz., 5 in., \$1.15@
\$1.20; 6 in., \$1.35@1.45.
Gas Pipe..... 7 8 10 12-in.
\$1.75 \$2.00 \$2.75 \$3.75

Acme Nippers..... 40c@40c
Bernard's:
Parallel Pliers, &c..... 75c
Paragon Pliers..... 50c
Lodi Pliers..... 50c
Elm City Fence Pliers..... 30c
Crown Hanger Co.:
"Iron"..... 60c
Improved Button..... 50c
Stub's..... 50c
Combination and others..... 40c
Heller's Farriers' Nippers, Pincers, and Tools 50c@60c
Morrell's Parallel, \$ doz. \$12.00..... 10c
P. S. & W. Cast Steel..... 30c@1.00@40c
P. S. & W. Tinnert's Cutting Nippers, 40c@40c@50c

Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds..... 40c

Plumbs and Levels-
Plumbs and Levels.
Dialton's..... 70c@1.00@70c@1.00
Pocket Levels..... 75c@1.00@75c@1.00
Stanley R. & L. Co..... 70c@1.00@70c@1.00
Stanley's Duplex..... 25c@1.00@25c@1.00
Woods' Extension..... 30c

Poachers, Egg-
Buffalo Steam Egg Poachers, \$ doz. No. 1, \$7.20; No. 2, \$11.00; No. 3, \$11.00; No. 4, \$14.50..... 50c

Points, Glaziers'-
Bulk and 1 lb. papers..... lb. 1 1/4 @ 1 1/4
1/4 lb. papers..... lb. 12 @ 12
1/4 lb. papers..... lb. 12 1/2 @ 12 1/2

Pokes, Animal-
Pt. Madison Hawkeye..... \$ doz. \$3.50
Pt. Madison, Western..... \$ doz. \$3.75

Police Goods-
Manufacturers' Lists..... 25c@25c
Tower's..... 25c

Polish-Metal-
Prestoline Liquid, No. 1 (1 qt.), \$ doz. \$3.00; No. 2 (1 qt.), \$9.72..... 40c
Prestoline Paste..... 35c@40c
U. S. Metal Polish Paste, 3 oz. boxes, \$ doz. 50c; \$ gr. \$4.50; 1/2 lb. boxes, \$ doz. \$1.25; 1 lb. boxes, \$ doz. \$2.25
U. S. Liquid, 8 oz. cans, \$ doz. \$1.25; \$ gr. \$1.20
Barker's Friend Metal Polish, \$ doz. \$1.75; \$ gr. \$1.80
Wynn's White Silk, 1/4 pt. cans, \$ doz. \$1.50

Stove-
Black Eagle Benzine Paste, 5 lb. cans, \$ doz. \$1.00
Black Eagle, Liquid, 1/4 pt. cans..... \$ doz. 75c
Black Jack Paste, 1/4 lb. cans, \$ doz. \$1.00
Ladd's Black Beauty, \$ gr. \$10.00..... 50c
Joseph Dixon's, \$ gr. \$5.75..... 10c
Dixon's Plumbago..... \$ gr. \$4.00
Firestone..... \$ gr. \$2.00
Gem, \$ gr. \$4.50..... 10c
Japanese..... \$ gr. \$3.50
Jet Black..... \$ gr. \$3.50
Peerless Iron Enamel, 1/4 pt. cans..... \$ doz. \$1.50
Wynn's Black Silk, 5 lb. pail..... each 75c
Wynn's Black Silk, 1/2 lb. box, \$ doz. \$1.00
Wynn's Black Silk, 5 oz. box, \$ doz. \$0.75
Wynn's Black Silk, 8 oz. liq., \$ doz. \$1.00

Poppers, Corn-
Round or Square:
1 qt..... \$ gro. \$7.00@8.00
1 1/2 qt..... \$ gro. 9.50@10.50
3 qt..... \$ gro. 10.50@11.50

Post Hole and Tree Augers and Diggers-
See also Diggers, Post Hole, &c.

Potato Parers-
See Parers, Potato.

Pots- Glue-
Enameled..... 40c@50c@1.00
Tinned..... 40c@1.00

Powder-
In Canisters:
Duck, 1 lb. each..... 50c
Fine Sporting, 1 lb. each..... 50c
Rifle, 1/2 lb. each..... 50c
Rifle, 1 lb. each..... 50c

In Kegs:
Duck, 6 1/2 lb. kegs..... \$2.25
Duck, 12 1/2 lb. kegs..... \$2.25
Duck, 25 lb. kegs..... \$2.25
Rifle, 6 1/2 lb. kegs..... \$2.25
Rifle, 12 1/2 lb. kegs..... \$2.25
Rifle, 25 lb. kegs..... \$2.00

King's Smokeless Shot Gun and Rifle:
Keg (25 lb. bulk)..... \$2.00
Half Keg (12 1/2 lb. bulk)..... \$1.25
Quarter Keg (6 1/2 lb. bulk)..... \$0.75
Canister (1 lb. bulk)..... \$1.00
King's Semi-Smokeless:
Keg (25 lb. bulk)..... \$2.00
Half Keg (12 1/2 lb. bulk)..... \$1.25
Quarter Keg (6 1/2 lb. bulk)..... \$0.75
One Pound Can. bulk..... \$0.50

Presses-
Fruit and Jelly-
Enterprise Mfg. Co..... 40c@25c

Pruning Hooks and Shears-See Shears.

Pullers, Nail-
Crown, \$ doz. \$15.00..... 50c
Crown Prince, \$ doz. \$15.00..... 50c
Cyclops..... 50c
Diamond B, No. 2, doz. \$5.00..... 40c
Eureka, \$ doz. \$16.00; 3 doz. \$40.00
Glant, No. 1, \$ doz. \$18; No. 2, \$10.00; No. 3, \$15.
Miller's Falls, No. 3, per doz. \$1.00

Pelican, \$ doz. \$9.00..... 40c@1.00
Seranton No. 1 and 2, \$ doz. \$9.00
Seranton, No. 3, \$ doz. \$9.50

often shaded by jobbers \$0.50@1.00

Shovels and Tongs—

Brass Head.....60¢ to 80¢ 10¢
 Iron Head.....60¢ to 80¢ 10¢

Sieves and Sifters—

Hunter's Imitation, gro. \$11.00 to 18.00
 Buffalo Metallic Blue, S. S. & Co. gr.:
 14 & 18.....18¢ to 20¢
 12 & 16.....15¢ to 18¢
 Eclipse.....gr. \$10.00
 Electric Light.....gr. \$12.00
 Hunter's Genuine.....gr. \$12.50
 Shaker (Barber's Pat.) Flour Sifters.....
 # doz., \$2.00.....30¢

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
 Mesh 18, Nested, doz.....\$0.75 to \$0.80
 Mesh 20, Nested, doz......85¢ to 1.00
 Mesh 24, Nested, doz.....1.00 to 1.05

Sinks—**Cast Iron—**

Standard list.....60¢ to 100¢
 Note.—There is not entire uniformity
 in lists used by fitters.

Wrought Steel—

Columbus Galv'd and Enamelled.....60¢ to 75¢
 Columbus, Painted......45¢
 L. & G. Mfg. Co., Galvanized.....50¢
 L. & G. Mfg. Co., Enamelled.....50¢

Skeins, Wagon—

Cast Iron.....70¢ to 100¢
 Malleable Iron.....40¢ to 50¢
 Steel.....35¢ to 45¢
 I. L. & Co. Steel.....85¢

Slates—

"D" Slates.....50¢ to 100¢
 Unexcelled Noiseless Slates.....
 60¢ to 100¢
 Wire Bound.....60¢ to 100¢
 Double Slates, add \$1 case, net.

Slaw Cutters—See Cutters.**Slicers, Vegetable—**

Sterling \$2.00.....33¢

Snap, Harness—

German.....60¢ to 100¢
 Covert Mfg. Co.:
 Derby.....35¢ to 45¢
 High Grade.....45¢ to 55¢
 Jockey.....45¢ to 55¢
 Trojan.....45¢ to 55¢

Covert's Saddlery Works:

Banner.....60¢ to 100¢
 Crown.....60¢ to 100¢
 Triumph.....60¢ to 100¢

W. & E. T. Fitch Co.:

Bristol.....40¢ to 100¢
 Empire.....50¢ to 100¢
 German.....40¢ to 100¢
 National.....50¢ to 100¢
 Perfect.....50¢ to 100¢
 Clipper.....50¢ to 100¢
 Champion.....40¢ to 100¢
 Security.....40¢ to 100¢
 Victor.....60¢ to 100¢

Orel's Community:

Solid Steel.....65¢ to 85¢
 Solid Steel.....65¢ to 85¢
 Sargent's Patent Guarded.....60¢ to 100¢

Snaths—

Scythe.....65¢ to 85¢

Snips, Tinnners'—See Shears.**Soldering Irons—**

See Irons, Soldering.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—

Silver Plated—

Flat Ware.....60¢ to 100¢
 Wm. Rogers Mfg. Co.....50¢ to 100¢

Miscellaneous—

German Silver.....60¢ to 100¢
 Wm. Rogers Mfg. Co.:
 185 German Silver.....60¢
 Rogers' Silver Metal.....50¢ to 100¢

Springs—

Door—

Gem (Coll.).....20¢
 Star (Coll.).....30¢
 Torrey's Rod, 39 in.....\$1.10 to \$1.25
 Warner's No. 2, # doz.....\$2.50 to \$3.00
 Victor (Coll.).....50¢ to 100¢

Carriage, Wagon, &c.

Factory Shipments.

3/4 in and wider.....Blk. Hf. Brt. Brt.
 1/4 1/2 3/4 1/2 3/4 1/2

Cliff's Bolster Springs.....35¢
 Cliff's Seat Springs.....pair 55¢

Sprinklers, Lawn—

Enterprise.....25¢ to 30¢
 Philadelphia No. 1, # doz.....\$12; No. 2,
 \$15; No. 3, \$20

Squares—

Nickel plated.....List Jan. 5, 1901

Steel and Iron.....70¢ to 100¢
 Rosewood Hdl. Try Square and T-Bevels.....60¢ to 100¢
 Iron Hdl. Try Squares and T-Bevels.....60¢ to 100¢

Squeezers—

Lemon—

Wood, Common, gro., No. 5, \$5.25
 \$5.50; No. 1, \$5.50 to \$5.50.
 Wood, Porcelain Lined:
 Cheap.....doz. \$3.00 to \$3.75
 Good Grade.....doz. \$3.00 to \$3.50

Tinned Iron.....doz. \$0.75 to 1.25

Iron, Porcelain Lined doz. \$3.50 to 5.25

Jennings' Star.....# doz. \$1.55 to 1.90

King.....# doz. \$2.00

Staples—

Barbed Blind.....lb. 8¢ to 10¢

Electricians', Association list. 75¢ to 10¢

Fence Staples, same price as Barbed

Wire. See Trade Report.

Poultry Netting, Staples.....per lb. 5c.

Gould Crossing Tack Co.'s list.....75¢ to 10¢

Steels, Butchers'—

Dick's.....40¢

Foster Bros.....40¢

C. & A. Hoffmann's.....40¢

Nichols Bros.....50¢

Steelyards.....25¢ to 35¢ 10¢**Stocks and Dies—**

Blacksmiths'.....40¢ to 100¢

Gardner Die Stocks, No. 1.....50¢

Gardner Die Stocks, larger sizes.....40¢

Green River.....25¢

Lightning Screw Plates.....25¢

Little Giant.....25¢

Roscoe's New Screw Plates.....25¢ to 30¢

Curtis Reversible Ratchet Die Stock.....25¢

Stone—**Soythe Stones—**

Pike Mfg. Co., list '95-'96.....33¢ to 45¢

Cleveland Stone Co., list Nov. '92.....33¢ to 45¢

Oil Stones, &c.

Pike Mfg. Co.:
 Hindostan No. 1, # B.....8¢

Sand Stone.....5¢

Turkey Oil Stone, Extra.....33¢ to 40¢

5 to 9 in.....50¢

Turkey Slips.....\$1.50

Lily White Washita.....60¢

Rosy Red Washita.....60¢

Washita Stone, Extra.....60¢

Washita Stone, No. 1.....40¢

Washita Stone, No. 2.....30¢

Lily White Slips.....90¢

Rosy Red Slips.....90¢

Washita Slips, Extra.....80¢

Washita Stone, No. 1, # to 5 in.....\$2.50

Arkansas Stone, No. 1, # to 5 in.....\$3.50

Arkansas Stone, No. 1, # to 5 in.....\$3.50

India Oil Stones.....25¢

Tanite Mills:
 Emery Oil, # doz. \$5.00.....50¢ to 80¢

Stoners—**Cherry—**

Enterprise.....25¢ to 30¢

Stops, Bench—

Millers Falls.....15¢ to 10¢

Morrill's.....# doz. No. 1, \$10.00; No. 2,
 \$11.00, 40¢ to 50¢

Stops, Window—

Ives' Patent.....25¢ to 55¢

Taplin's.....45¢

Wilcox, Steel, per doz. \$0.00.....60¢

Stove Boards—

See Boards, Stove.

Stove Polish—See Polish, Stove.**Straps, Box—**

Cary's Universal, case lots.....20¢ to 10¢

Stretchers, Carpet—

Cast Iron, Steel Points.....doz. 55¢ to 65¢

Cast Steel, Polished.....doz. \$2.25

Socket.....doz. \$1.75

Stuffers, Sausage—

Miles' Challenge, # doz. \$30.....50¢ to 55¢

Enterprise Mfg. Co.....25¢ to 30¢

National Specialty Mfg. Co., list Jan.
 1, '97.....30¢

Tacks Brads, &c.—

See Trade Report.

List Jan. 15, '99.

Carpet Tacks, American.....90¢ to 100¢

American Cut Tacks.....90¢ to 100¢

Swedes Iron Tacks.....90¢ to 100¢

Swedes Upholsterers' Tacks.....90¢ to 100¢

Gimp Tacks.....90¢ to 100¢

Lace Tacks.....90¢ to 100¢

Trimmers' Tacks.....90¢ to 100¢

Looking Glass Tacks.....70¢ to 100¢

Bill Posters' and Railroad Tack.....90¢ to 100¢

Hungarian Nails.....80¢ to 100¢

Common and Patent Brads.....70¢ to 100¢

Trunk and Clout Nails.....80¢ to 100¢

NOTE.—The above prices are for
 straight weights. An extra 5¢ is given
 for Standard Weights.

Miscellaneous—

Double Point Tacks.....90¢ to 7 or 8 tens

Steel Wire Brads, R. & E. Mfg.
 Co.'s list.....50¢ to 100¢

See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. \$3.20

Emerald, S. S. & Co.....60-gal. \$4.00

Queen City S. S. & Co., 10-gal.....\$3.50

Queen City S. S. & Co., 60-gal.....\$4.25

Tapes, Measuring—

American Asses' Skin.....10¢ to 100¢

Patent Leather.....25¢ to 30¢

Steel.....10¢ to 100¢

Chesterman's.....25¢ to 30¢

Eddy's Steel.....40¢ to 100¢

Keuffel & Esser Co., Steel and Metallic

Lower list, 1899.....35¢

Lufkin's Steel.....33¢ to 35¢

Lufkin's Metallic.....30¢ to 35¢

Thermometers—

Tin Case.....30¢ to 100¢

Ties, Bale—Steel.

Standard Wire.....50¢ to 100¢

Ties, Wall—

Cleveland Wire Spring Co.:
 Galv. Steel 5-32 x 6 1/2 in. # 1000 \$10.00

Galv. Steel 5-32 x 8 1/2 in. # 1000 \$11.00

Galv. Steel 5-32 x 11 1/2 in. # 000 \$12.00

Galv. Steel 5-32 x 15 1/2 in. # 1000 \$14.00

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pleced, sold
 very generally at net prices.

Tire Benders, Upsetters,

&c.—See Benders and Upset-

ters, Tire.

Tobacco Cutters—

See Cutters, Tobacco.

Tools—**Coopers'—**

L. & I. J. White.....20¢ to 30¢

Saw—

Atkins' new list.....40¢

Simonds' Improved.....33¢

Simonds' Crescent.....25¢

Ship—

L. & I. J. White.....25¢

Transom Lifters—

See Lifters, Transom.

Traps—Game—

Oneida Pattern.....70¢ to 100¢

Newhouse.....45¢ to 50¢

Hawley & Norton.....85¢ to 100¢

Victor (Oneida Pattern).....75¢ to 100¢

Star (Blake Pattern).....65¢ to 100¢

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 9¢ to 10¢

Mouse, Round or Square Wire.....doz. \$0.85 to 1.00

Marty French Rat and Mouse Traps
 (Genuine):
 No. 1, Rat, # doz. \$12.00; case of 50
 \$10.50

No. 3, Rat, # doz. \$5.50; case of 50
 \$5.00

No. 3 1/2, Rat, # doz. \$1.50; case of 72
 \$4.00

No. 4, Mouse, # doz. \$3.50; case of 72
 \$2.75

No. 5, Mouse, # doz. \$2.75; case of 150
 \$2.25

Schuyler's Rat Killer, No. 1, # gr. \$30.00;
 No. 2, # gr. \$30.00; Mouse, No. 3,
 \$18.00.....50¢

Flv—

Balloon, Globe or Acme.....doz. \$1.15 to 1.25; gro. \$12.00 to 14.00

Harper, Champion or Paragon.....doz. \$1.25 to 1.40; gro. \$13.50 to 15.00

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40¢

Stearns.....25¢

Trowels—

Diston Brick and Pointing.....30¢

Diston Plastering.....25¢

Diston "Standard Brand" and Gas-
 den Trowels.....40¢

Never-Break steel Garden Trowels.....gro. \$7.00

Peace's Plastering.....30¢

Wood Brick and Plastering.....25¢ to 35¢

Worrough & McFarlin, Plastering.....25¢ to 35¢

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40¢

Daisy Stove Trucks, Improved pattern
 # doz. \$21.00

Model Stove Trucks.....# doz. \$18.50

Tubs, Wash—

No. 1 2 3

Galvanized, per doz. \$5.00 5 50 6 00

Galvanized Wash tubs (S. S. & Co.):
 No. 1 2 3 10 20 30

Per doz \$5 25 6 00 6 75 6 50 7 25 8 00

Washers—
Leather, Axle—

Solid.....80¢10¢10¢85¢
Patent.....85¢85¢55¢
Coil: 1/4 1 1 1/4 1 1/2 Inch.
11c 19c 13c 15c per 100

Iron or Steel—

Size bolt... 5-16 3/4 1/2 3/4 3/4
Washers.....\$5.50 4.70 3.00 3.00
In lots less than one keg add 1/4c per lb., 5-lb. boxes add 1/4c to list.

Last Washers

Over 1/2 inch barrel lots.....per lb., 2c

Washer Cutters—

See Cutters, Washer.

Washing Machines—

See Machines, Washing.

Water Coolers—

See Coolers, Water.

Weaners—

Tyler's New Haler—No. 1 1/2 doz. \$3.45;
No. 2, \$3.70; No. 3, \$4.00; No. 4, \$4.30
Tyler's Safety—Nos. 1 and 2, 1/2 doz. \$1.70;
No. 3, \$2.00; No. 4, \$2.30.

Wedges—

Oil Finish.....lb. 3 1/4c
Axe Finish.....lb. 4c

Weights, Sash—

Eastern prices.....\$25.00
Western prices.....\$20.00
Note: There is a wide difference in prices East and West, and some Foundries are naming lower prices than the above.

Well Buckets, Galvanized

See Pails, Galvanized.

Wheels Well—

8-in., \$1.75 to \$1.85; 10-in., \$2.25 to \$2.35;
12-in., \$2.75 to \$2.85; 14-in., \$3.25 to \$3.40

Wire and Wire Goods—

Brt. and Ann., 6 to 9.....70¢10¢
Brt. and Ann., 10 to 12.....75¢10¢
Brt. and Ann., 13 to 16.....75¢10¢
Brt. and Ann., 17 to 19.....75¢10¢
Cord'd and Galv., 6 to 9.....65¢10¢
Cord'd and Galv., 10 to 12.....70¢10¢
Cord'd and Galv., 13 to 16.....70¢10¢
Cord'd and Galv., 17 to 19.....70¢10¢
Tinned, 6 to 9.....70¢10¢
Tinned, 10 to 12.....70¢10¢
Tinned, 13 to 16.....65¢10¢
Tinned, 17 to 19.....65¢10¢
Annealed Wire on Spools.....60¢10¢10¢70¢
Brass and Copper Wire on Spools.....50¢10¢60¢
Brass, list Feb. 26, '96.....20¢

Copper, list Feb. 26, '96.....15¢
Cast Steel Wire.....50¢
Stub's Steel Wire.....\$6.00 to \$2.40¢
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Iron and Brass, list July 1, 1899.....85¢10¢95¢10¢5¢

Wire Cloth and Netting—

Galvanized Wire Netting 30¢10¢5¢2¢
Painted Screen Cloth per 100ft.....\$1.30 to \$1.40

Hardware Grade, Iron:

Baxter's S.....sq. ft. 3 1/4¢5¢
2 to 20 mesh.....sq. ft. 3¢5 1/4¢
20 to 30 mesh.....sq. ft. 3¢5 1/4¢
Galv. Hardware Grade, 2 to 5 mesh.....sq. ft. 3 1/4¢3 1/4¢
Galv. Hardware Grade, 6 to 8 mesh.....sq. ft. 4¢4 1/4¢

Wire Barb—See Trade Repor

Wire, Rope—See Rope, Wire.

Wrenches—

Agricultural.....70¢10¢70¢10¢5¢
Baxter's S.....80¢10¢
Coes' Genuine.....40¢10¢5¢5¢
Coes' "Mechanics".....40¢10¢10¢5¢5¢
Acme.....60¢10¢
Alken's Pocket (Bright).....50¢10¢
Alligator.....60¢10¢10¢

Bemis & Call's:
Adjustable S.....35¢5¢
Brigg's S Pipe.....40¢
Brigg's Pattern.....30¢10¢
Combination Black.....40¢5¢
Combination Bright.....40¢
Cylinder or Gas Pipe.....55¢
Extra Heavy.....45¢
Merrick's Pattern.....50¢
No. 3 Pipe, Bright.....55¢
Radley Automatic.....30¢
Boardman's.....33¢
Bull Dog, W. & B.....60¢10¢10¢
Donohue's Engineer.....40¢10¢
Eagle.....40¢10¢
Hercules.....70¢
Solid Handles, P. S. & W.....60¢10¢10¢
Stevenson.....

Wrought Goods—

Staples, Hooks, &c., list March 17 '92.....85¢5¢35¢10¢

Yokes, Neck—

Covert Saddlery Works, Trimmed 1.60¢5¢
Covert Saddlery Works, Neck Yokes.....70¢
Centers.....

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers & Freighters'.....list not

Zinc—

Sheet.....lb 6 1/4¢ to 7¢

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.

Lead, Foreign white, in Oil.....7 1/2¢ 9 1/2¢
Lead, American White, in Oil:
Lots of 500 lb or over.....@ 6 1/2¢
Lots less than 500 lb.....@ 6 1/4¢
Lead, White, in oil, 25 lb tin
pails, add to keg price.....@ 3 1/4¢
Lead, White, in oil, 12 1/2 lb tin
pails, add to keg price.....@ 1¢
Lead, White, in oil, 1 to 5 lb as-
sorted tins, add to keg price.....@ 1 1/4¢
Lead, White, in oil, 12 1/2 lb tin
pails, add to keg price.....@ 1 1/4¢
Lead, American, Terms: On lots of 500
lbs. and over, 60 days, or 2% for cash if
paid in 15 days from date of invoice.

Zinc, American, dry.....@ 4 1/4¢ 4 1/2¢
Zinc, Paris, Red Seal, dry.....@ 8 1/2¢
Zinc, Paris, Green Seal, dry.....@ 8 1/2¢
Zinc, Antwerp, Red Seal, dry.....@ 7 1/2¢
Zinc, Antwerp, Green Seal, dry.....@ 8 1/2¢
Zinc, V. M. French, in Poppy
Oil, Green Seal,
lots of 1 ton and over.....@ 11 1/4¢
lots less than 1 ton.....@ 12 1/4¢
Zinc, V. M. French, in Poppy Oil,
Red Seal.....@ 10 1/4¢ 11 1/4¢
Green Seal.....@ 11 1/4¢ 12 1/4¢

DISCOUNTS.—V. M. French Zinc.—Dis-
counts to buyers of 10 bbl. lots of one or
assorted grades, 1%: 25 bbls., 2%: 50
bbls., 4%.

Dry Colors.

Black, Carbon.....@ 7 1/2¢ 20¢
Black, Drop, Amer.....@ 2 1/4¢ 4¢
Black, Drop, Eug.....@ 7 1/2¢ 11¢
Black, Ivory.....@ 15¢ 21¢
Lamp, Com.....@ 3¢ 5¢
Blue, Celestial.....@ 2 1/4¢ 8¢
Blue, Chinese.....@ 35¢ 40¢
Blue, Prussian.....@ 30¢ 38¢
Blue, Ultramarine.....@ 3¢ 35¢
Brown, Spanish.....@ 1 1/4¢ 1¢
Brown, Vandyke, Amer.....@ 1 1/4¢ 2¢
Brown, Vandyke, Foreign.....@ 3 1/4¢ 3¢
Carmine, No. 40.....@ \$2.15 to \$2.75
Green, Chrome, ordinary.....@ 5¢ 6¢

Green, Chrome, pure.....15¢ 20¢

Lead, Red, bbls. 1/2 bbls. and kegs:
Lots less than 500 lb.....@ 6¢
Lots less than 500 lb.....@ 6 1/4¢
Litharge, bbls. 1/2 bbls. and kegs:
Lots less than 500 lb.....@ 6¢
Lots less than 500 lb.....@ 6 1/4¢
Ocher, French Washed.....@ 14¢ 2¢
Ocher, Dutch Washed.....@ 4¢ 5¢
Ocher, American.....@ 10¢ 15¢ 50¢
Orange Mineral, English.....@ 9¢ 12¢
Orange Mineral, French.....@ 11¢ 15¢
Orange Mineral, German.....@ 9¢ 12¢
Orange Mineral, American.....@ 8¢ 14¢
Red, Indian, English.....@ 4¢ 8¢
Red, Indian, American.....@ 3¢ 3 1/4¢
Red, Turkey, English.....@ 4¢ 6¢
Red, Tuscan, English.....@ 7¢ 10¢
Red, Venetian, Amer.....@ 100¢ 1¢
Red Venetian, English.....@ 1.80 to 2.10

Sienna, Italian, Burnt and
Powdered.....@ 3 1/4¢ 9 1/4¢
Sienna, Ital., Raw, Powdered.....@ 3 1/4¢ 7 1/4¢
Sienna, American, Raw.....@ 1 1/4¢ 2¢
Sienna, American, Burnt and
Powdered.....@ 1 1/4¢ 2¢
Talc, French.....@ 100¢ \$1.35 to \$6.00
Talc, American.....@ 90¢ \$1.10
Terra Alba, French.....@ 100¢ 2¢ 95¢ 1.00
Terra Alba, English.....@ 95¢ 1.00
Terra Alba, American No. 1.....@ 65¢ 70¢
Terra Alba, American No. 2.....@ 45¢ 50¢

Umber, Turkey, But. & Pow.....@ 2 1/4¢ 3 1/4¢
Umber, Turkey, Raw & Powd.....@ 2 1/4¢ 3 1/4¢
Umber, But. Amer.....@ 1 1/4¢ 2¢
Umber, Raw, Amer.....@ 1 1/4¢ 2¢
Yellow, Chrome.....@ 10¢ 25¢
Vermillion, American Lead.....@ 10¢ 25¢
Vermillion, Quicksilver, bulk.....@ 72¢
Vermillion, Quicksilver, bags.....@ 73¢
Vermillion, English, Import.....@ 60¢
Vermillion, Chinese.....@ 88¢ 93¢

Colors in Oil.

Black, Lampblack.....@ 10¢ 14¢
Blue, Chinese.....@ 36¢ 40¢
Blue, Prussian.....@ 32¢ 38¢
Blue, Ultramarine.....@ 19¢ 16¢

Brown, Vandyke.....@ 9 1/4¢ 13¢
Green, Chrome.....@ 8¢ 12¢
Green, Paris.....@ 24¢
Sienna, Raw.....@ 10¢ 13¢
Sienna, Burnt.....@ 10¢ 13¢
Umber, Raw.....@ 9 1/4¢ 13¢
Umber, Burnt.....@ 9 1/4¢ 13¢

Miscellaneous.

Barytes, Foreign, 1 ton.....@ \$19.00 to \$21.00
Barytes, Amer. floated.....@ 19.00 to 20.00
Barytes, Crude.....@ 9.00 to 10.00
Chalk, in bulk.....@ 2.15 to 2.25
Chalk, in bbls.....@ 100¢ 35¢
China Clay, English, 1 ton.....@ 12.00 to 17.50
Cobalt, Oxide.....@ 100¢ 2.25 to 2.50
Whiting, Common.....@ 100¢ 42¢ 52¢
Whiting, Gliders.....@ 54¢ 64¢
Whiting, extra Gliders.....@ 53¢ 63¢

Putty.

In bulk.....@ \$1.00
In bladders.....@ 2.40
In cans, 12 lb to 25 lb.....@ 2.50
In cans, 1 lb to 5 lb.....@ 3.50

Spirits Turpentine.

In Southern bbls.....@ 44¢ 46¢
In machine bbls.....@ 45¢ 46¢

Glue.

Low Grade.....@ 12¢ 15¢
Cabinet.....@ 13¢ 16¢
Medium White.....@ 14¢ 16¢
Extra White.....@ 18¢ 23¢
French.....@ 12¢ 25¢
Irish.....@ 13¢ 16¢

Animal, Fish and Vege-

table Oils.

Linseed, City, raw.....@ gal. 87¢ 69¢

Linseed, City, boiled.....@ 69¢ 71¢
Linseed, State and West'n, raw.....@ 67¢
Linseed, raw Calcutta seed.....@ 76¢
Lard, Prime.....@ 55¢ 57¢
Lard, Extra No. 1.....@ 48¢ 50¢
Lard, No. 1.....@ 41¢ 43¢
Cotton-seed, Crude.....@ 34¢
Cotton-seed, Summer Yellow,
prime.....@ 36¢ 37¢
Cotton-seed Summer Yellow,
off grades.....@ 36¢ 39¢

Sperm, Crude.....@
Sperm, Natural Spring.....@
Sperm, Bleached Spring.....@
Sperm, Natural Winter.....@ 57¢
Sperm, Bleached Winter.....@ 52¢
Whale, Crude.....@ 38¢
Whale, Natural Winter.....@ 47¢
Whale, Bleached Winter.....@ 49¢
Menhaden, Crude, Sound.....@ 25¢
Menhaden, Light Strained.....@ 29¢ 30¢
Menhaden, Bleached Winter.....@
Menhaden, Extra Bleached.....@ 37¢
Tallow, prime.....@ 53¢ 54¢
Cocoanut, Ceylon.....@ 54¢ 6¢
Cocoanut, Cochin.....@ 64¢ 6¢
Cod, Domestic.....@ 30¢ 33¢
Cod, Newfoundland.....@ 36¢ 38¢
Red Elaine.....@ 34¢ 36¢
Red Saponified.....@ 5¢
Olive, Italian, bbls.....@ 57¢ 60¢
Neatsfoot, prime.....@ 48¢ 50¢
Palm, prime, Lagos.....@ 53¢ 6¢

Mineral Oils.

Black, 20 gravity, 25 to 30 cold
test.....@ gal. 93¢ 104¢
Black, 20 gravity, 15 cold test.....@ 104¢ 114¢
Black, summer.....@ 9¢ 9 1/2¢
Cylinder, light filtered.....@ 145¢ 174¢
Cylinder, dark filtered.....@ 113¢ 164¢
Paraffine, 903-907 gravity.....@ 144¢ 154¢
Paraffine, 903 gravity.....@ 134¢ 144¢
Paraffine, 883 gravity.....@ 124¢ 134¢
Paraffine, red, No. 1.....@ 144¢ 154¢
In small lots 1/2¢ advance.

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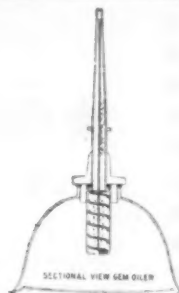
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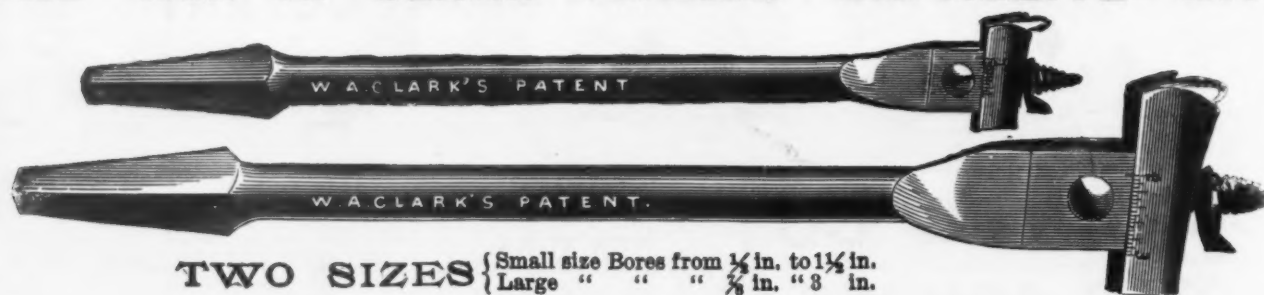
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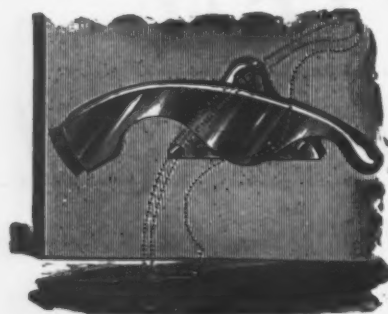
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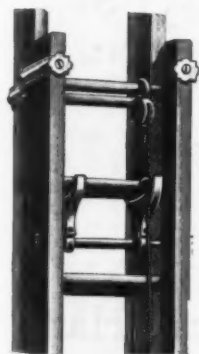
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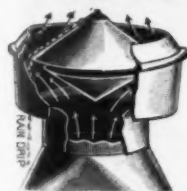
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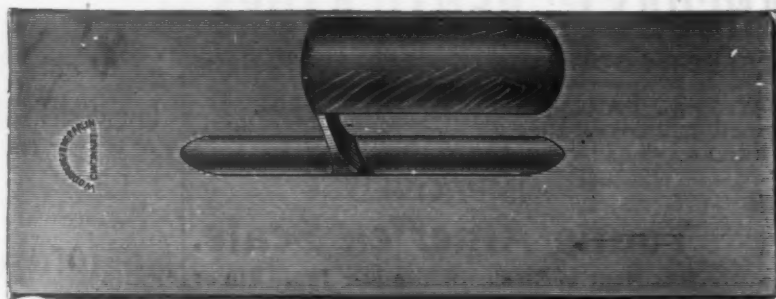
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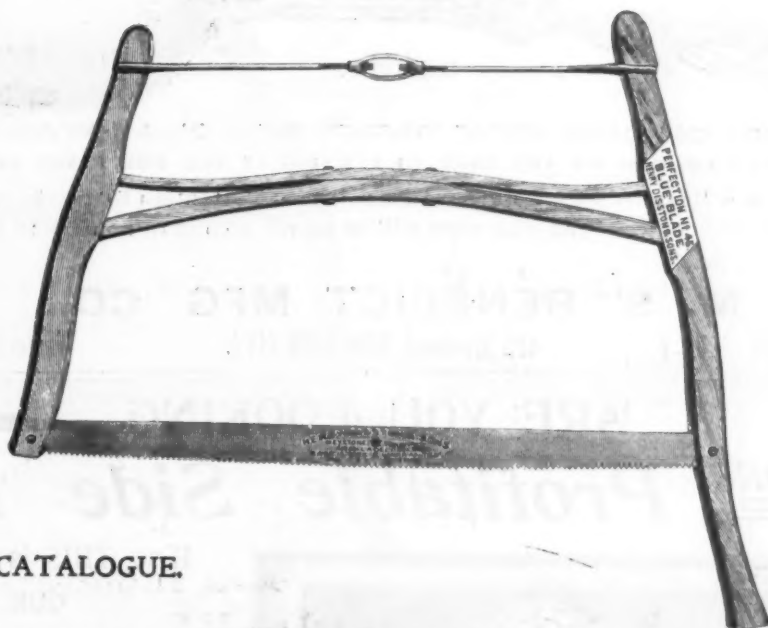
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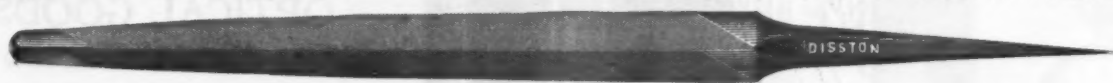
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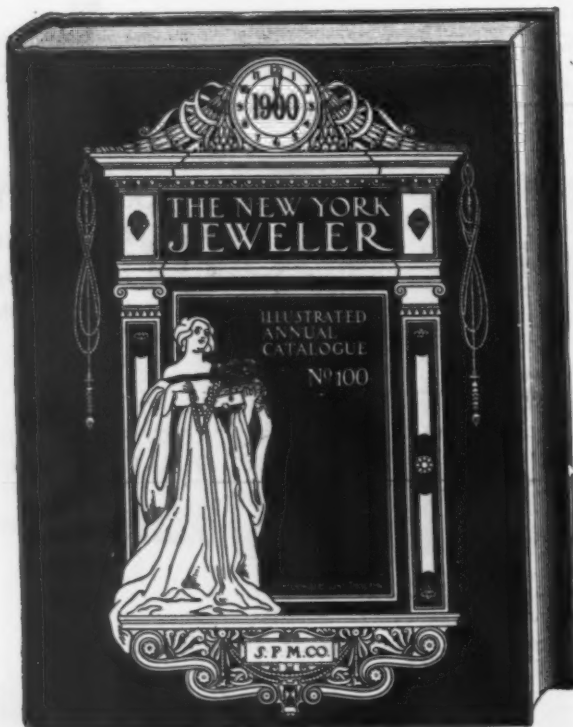
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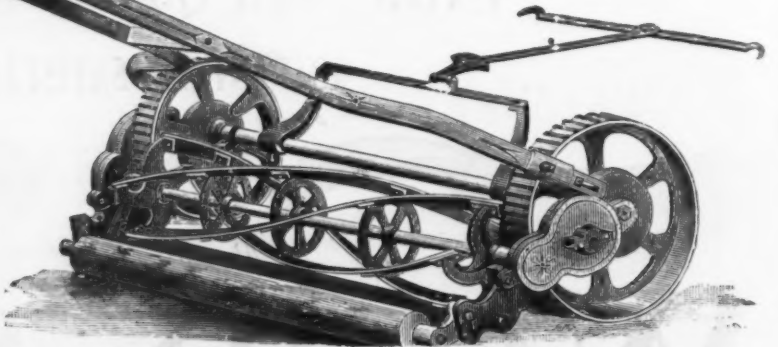
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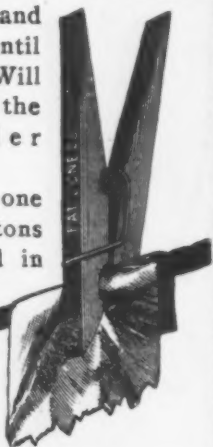
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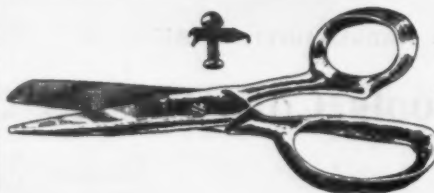
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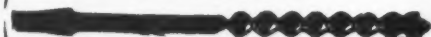
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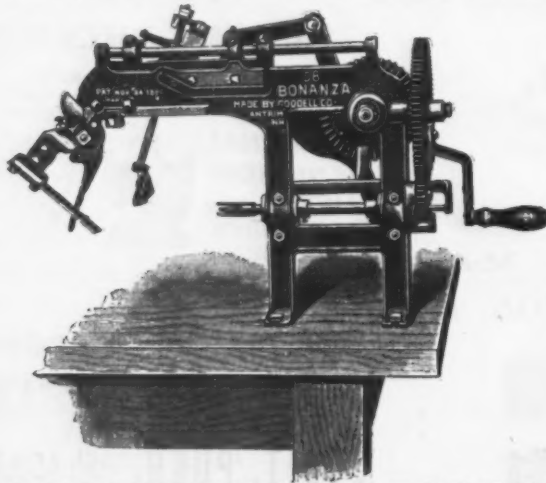
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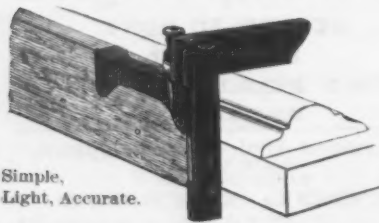
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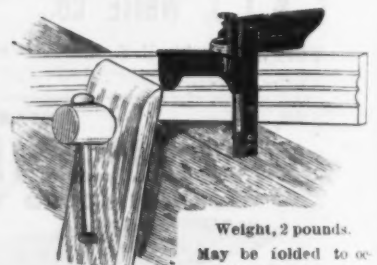


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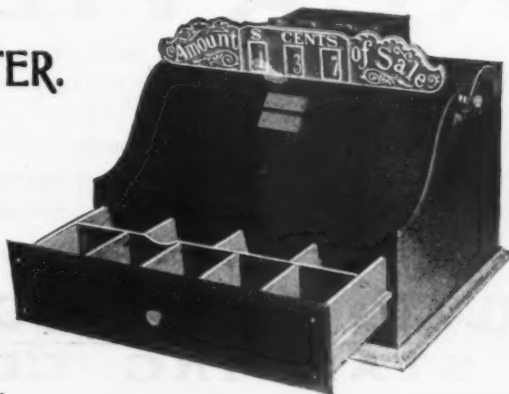
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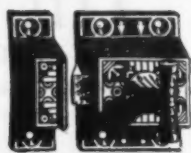
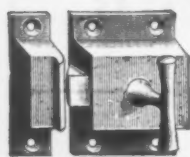
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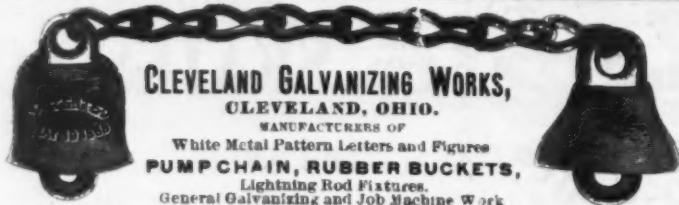
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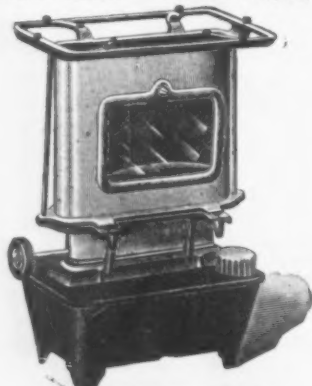
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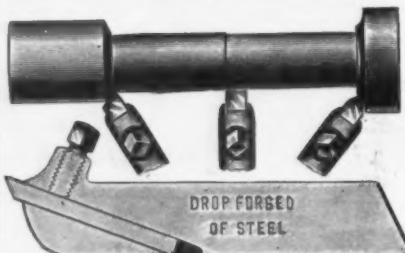


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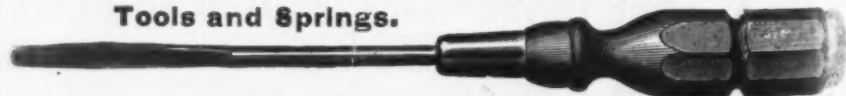
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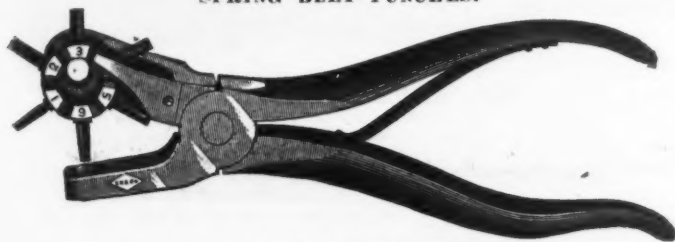
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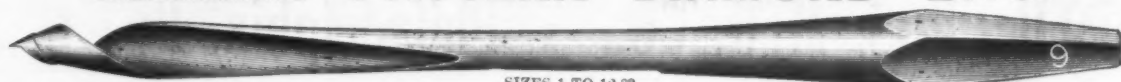


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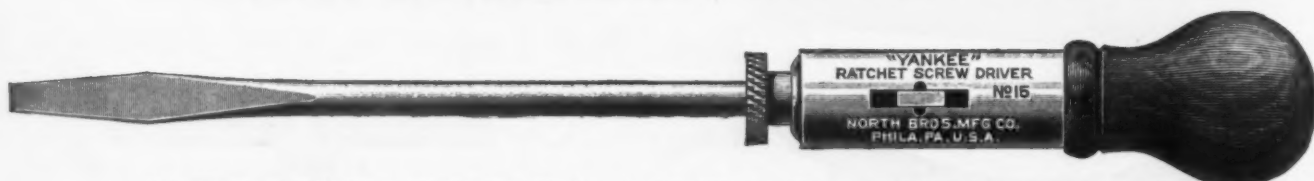
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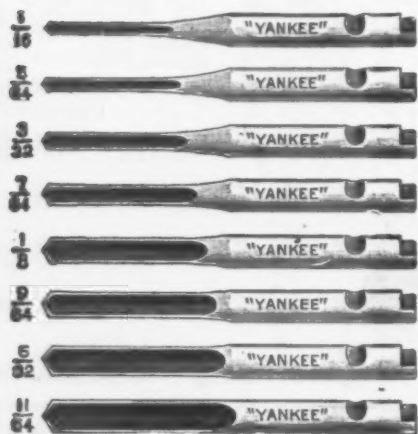
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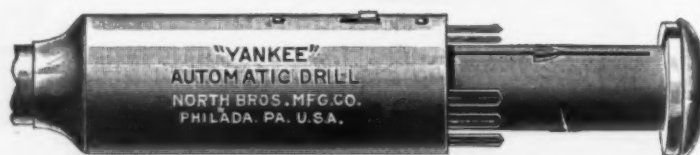
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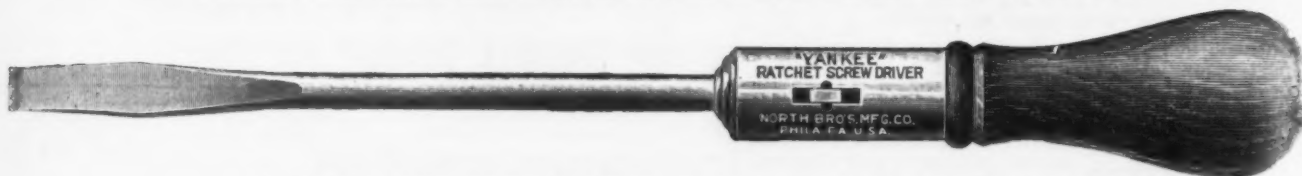
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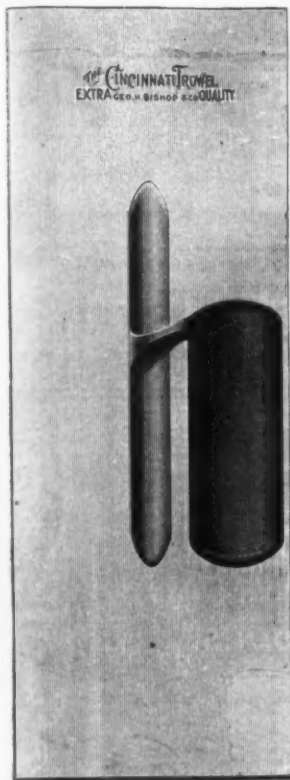
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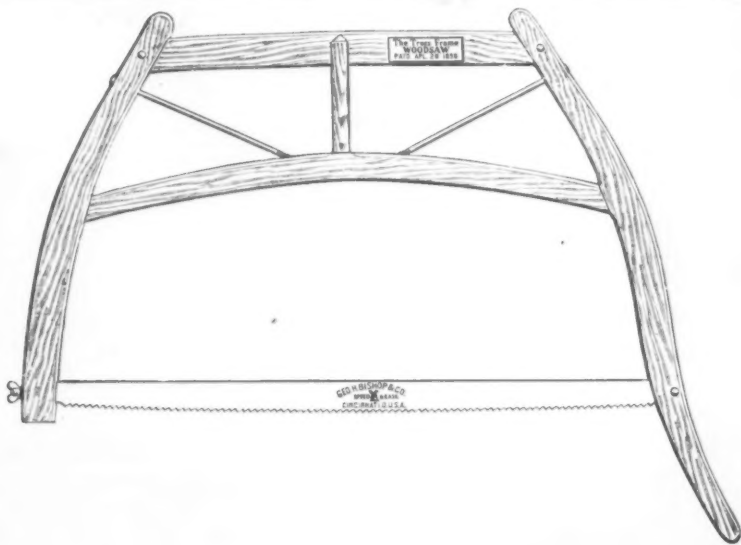
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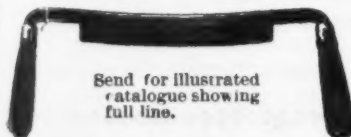


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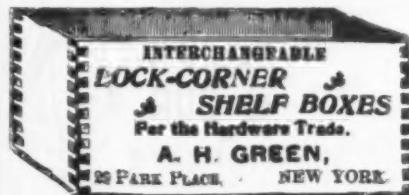
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Especially adapted for Hardware Stores.



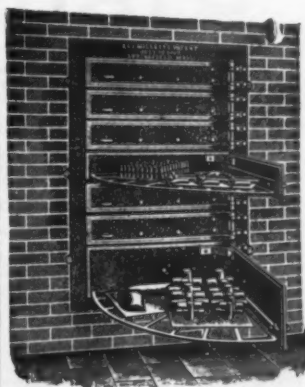
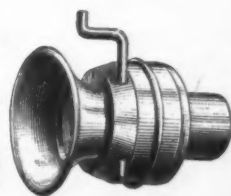
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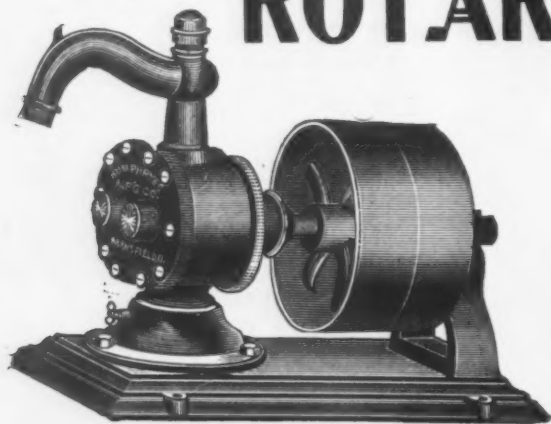
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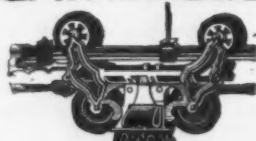
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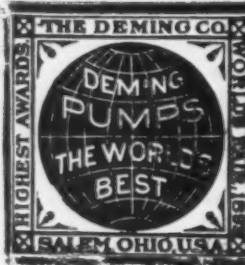
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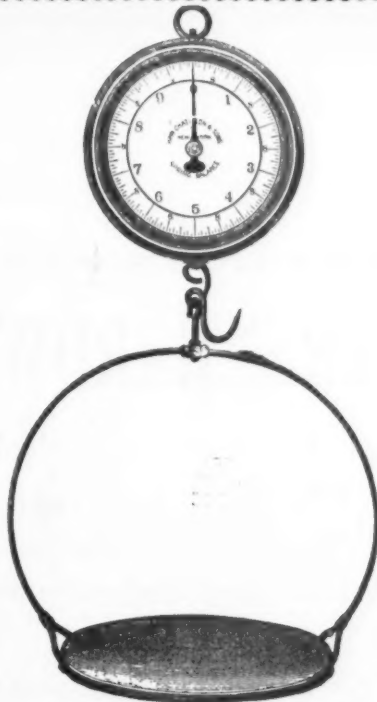
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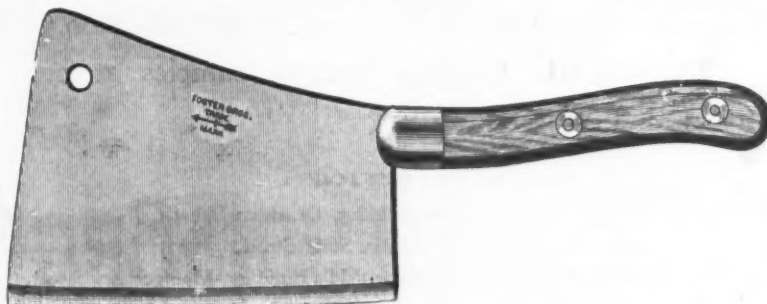
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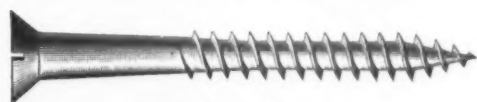
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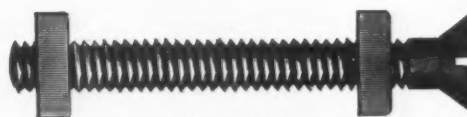
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THEY ARE
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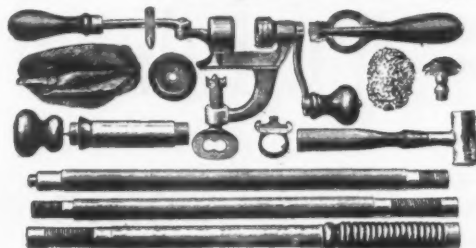
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Guess he does, for it's fun for me to use 'em.

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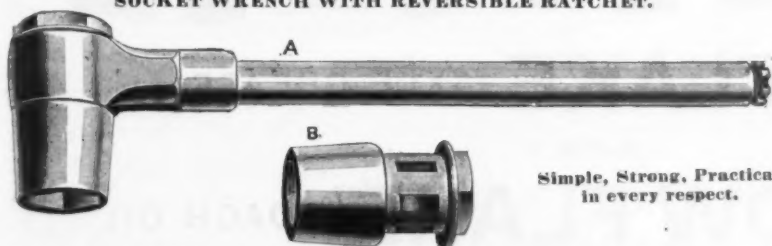
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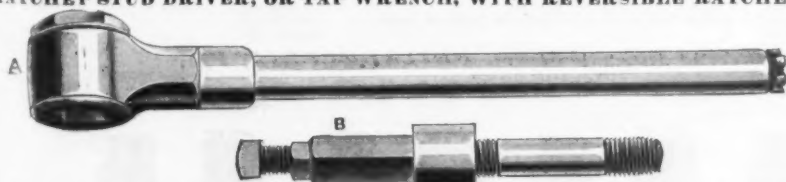
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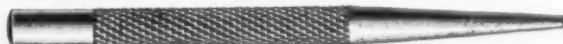
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The Handiest and Most Perfect Clamp.

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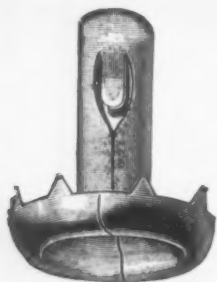
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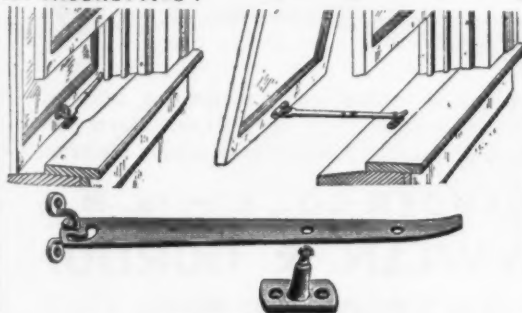
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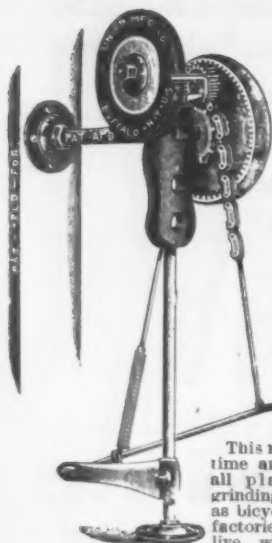
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NO. 16 A

NEW TOOLS—Combination Squares with hardened blades; new style Combination Square, No. 17; Carpenters' Square; Center Square; Pocket Slide Caliper; Micrometer Gauge No. 24, 12 to 36 in.; Micrometers with finger ring; Micrometers with ratchet stop; Attachment for converting a 2 in. into a 1 in. Micrometer; Micrometer No. 127, 0 to 12 in.; Inside Micrometer, 32 to 107 in.; Thickness Gauge, No. 172; Inspectors' Gauges; Little Giant Jack Screws; Complete line of Hack Saws; Universal Surface Gauge, No. 57; Screw-adjusting Calipers; Double Calipers; Carpenters' Dividers, No. 92; Stair Gauge Fixtures, No. 111; Trammels, No. 59; Drill and Tap Gauges.

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Every machine warranted.
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The price is right.

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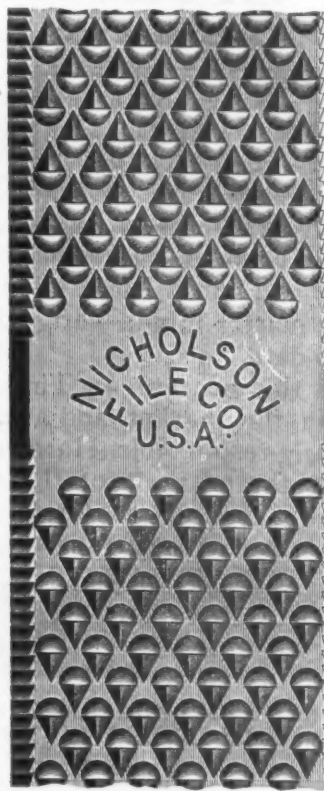
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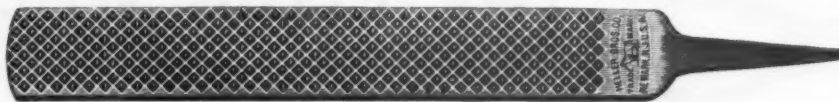
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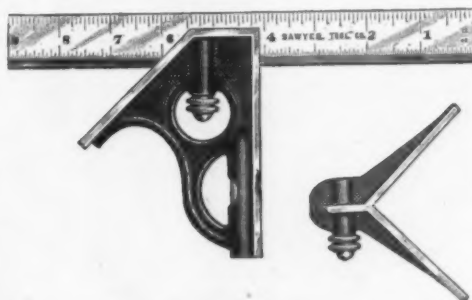


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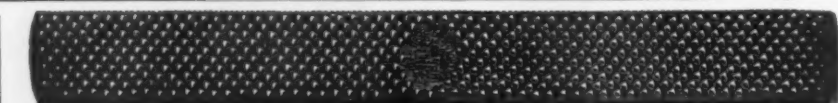
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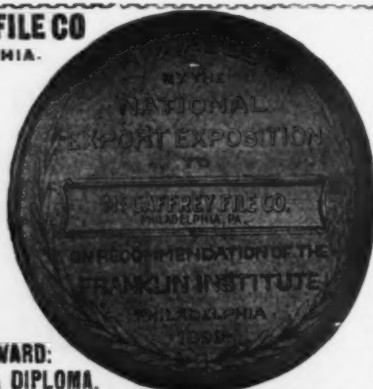
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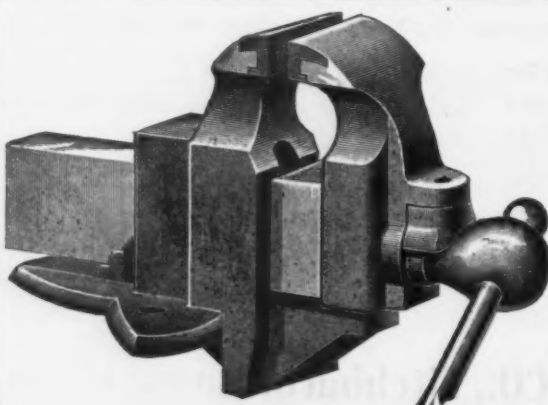
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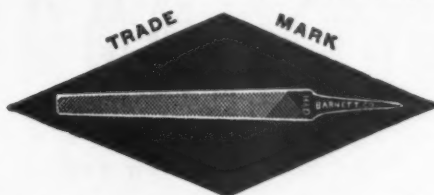
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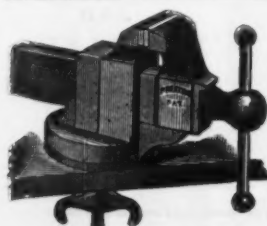


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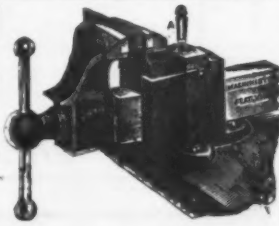
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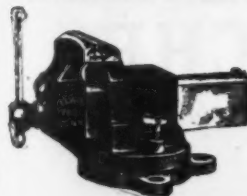
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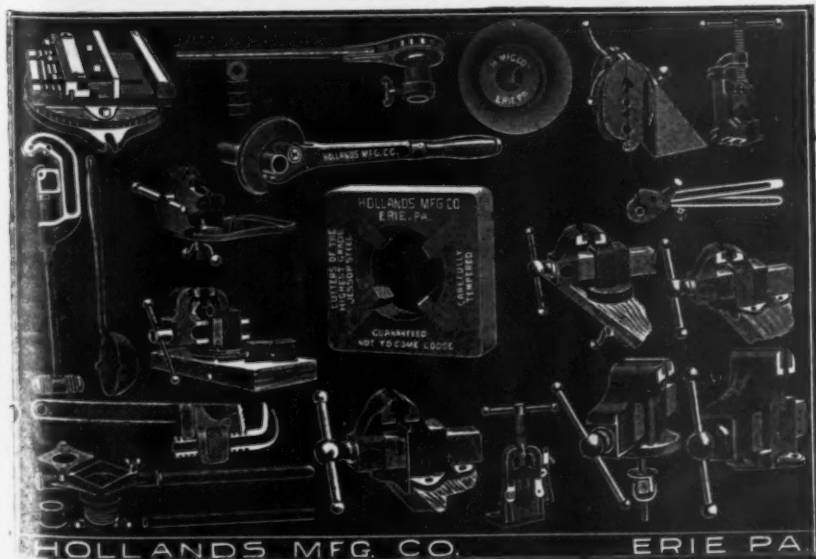


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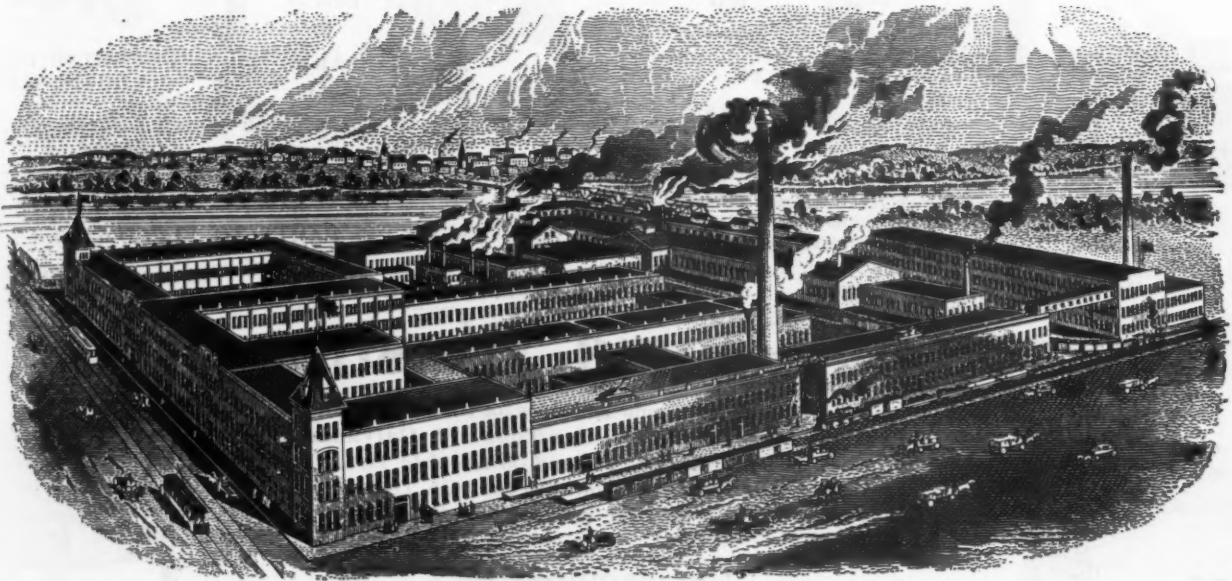
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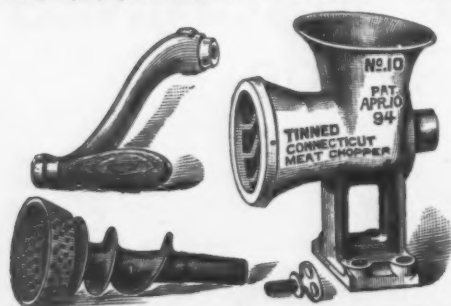
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DO IT ALL with a - -

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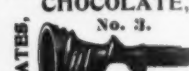


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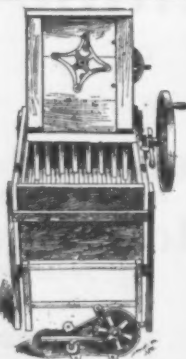
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No complicated gearing to get out of order or broken. Simply one large pinion fastened on the shell or cover; on a small pinion attached to the post; another small pinion meshing in the large one attached to shaft, and the Rack Bar; that's all. Washer operates right or left, the large hand wheel is attached to side of tub, does not have to be lifted with the cover; when latter is down it is always ready for business.



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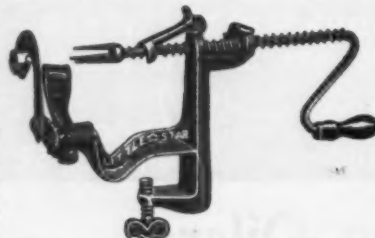
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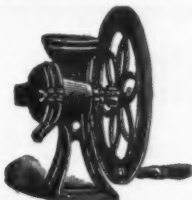
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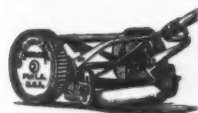
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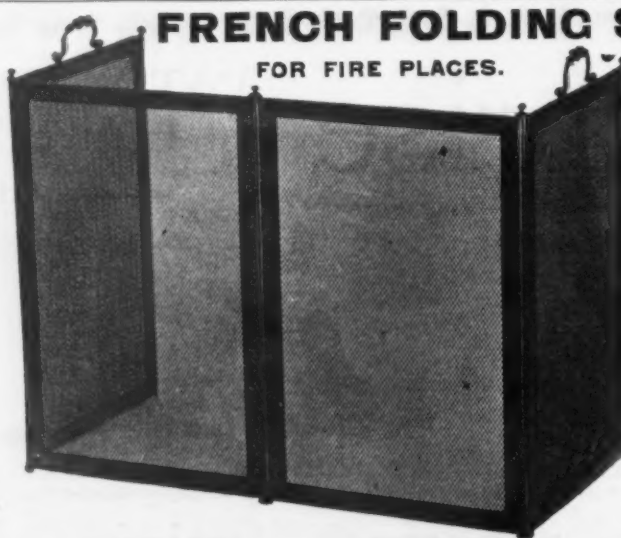
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A Quick Seller.
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Trade sample on application.
"Mamma says she wouldn't
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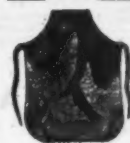
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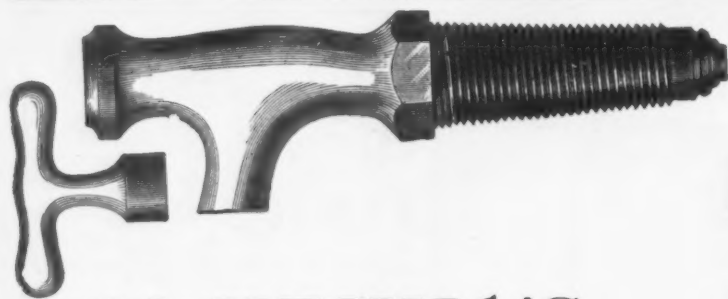
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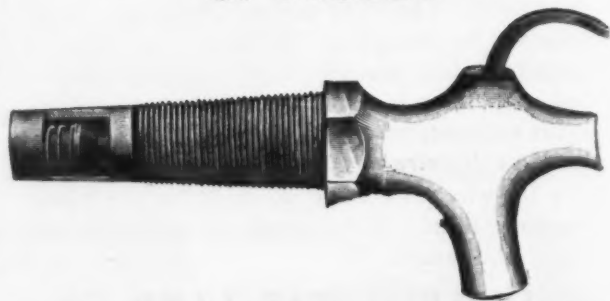
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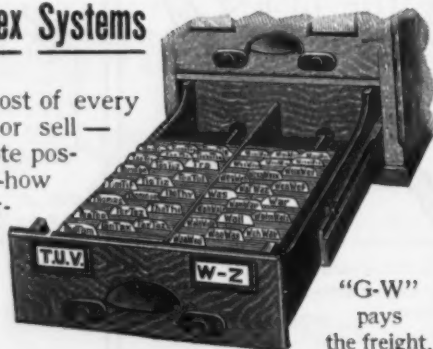
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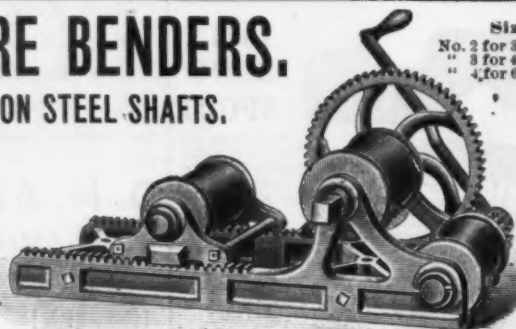
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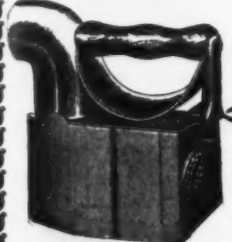
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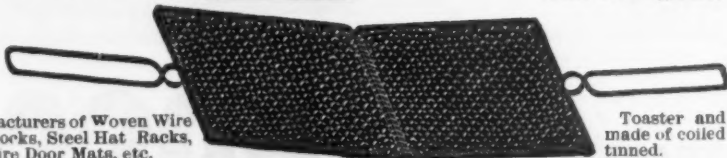
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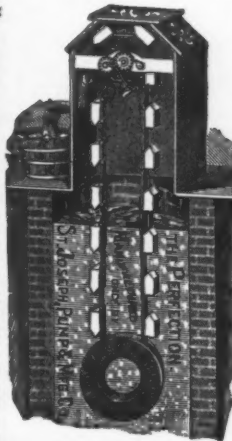
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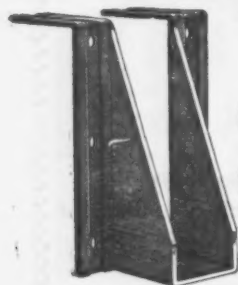
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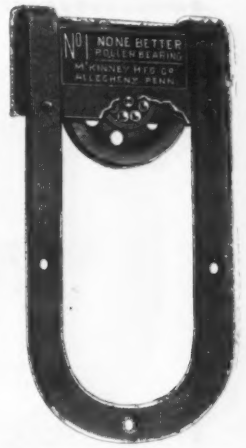


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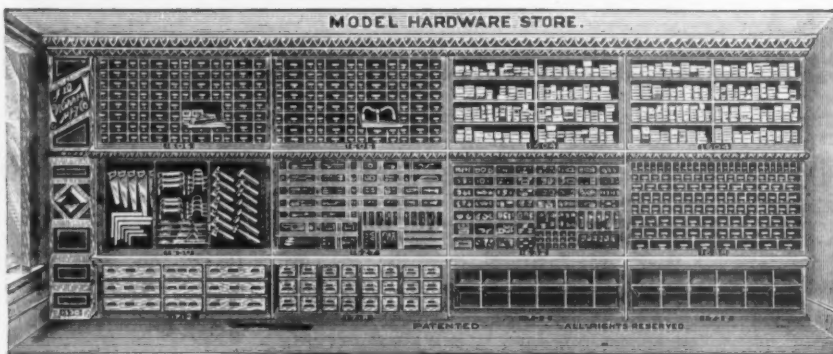
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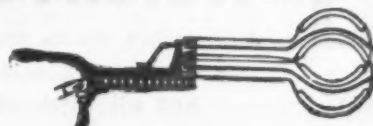
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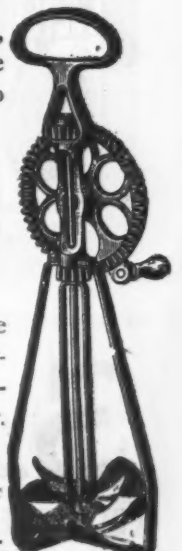
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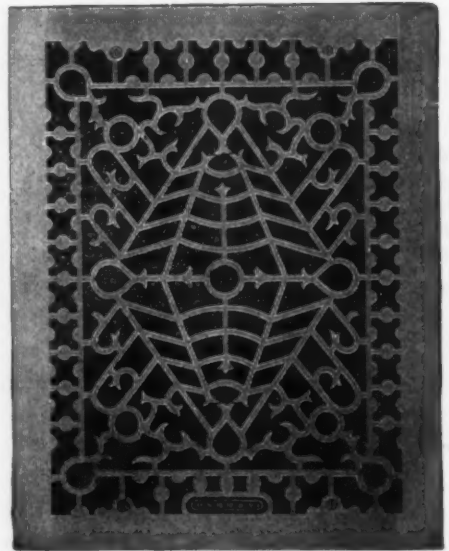
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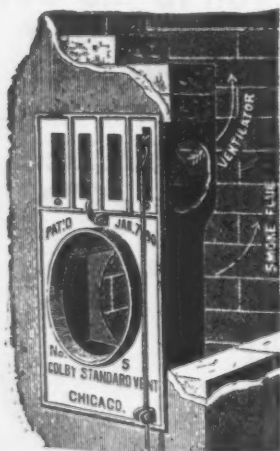


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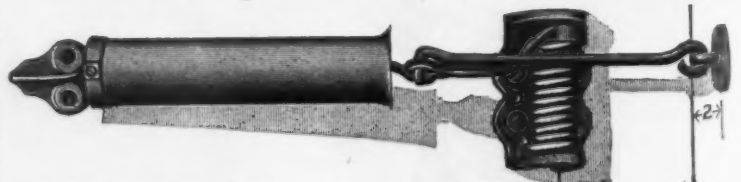
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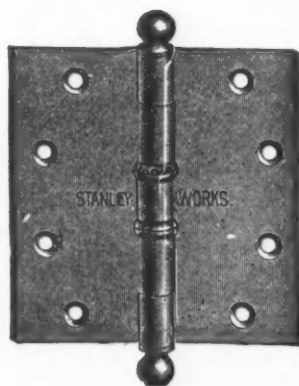
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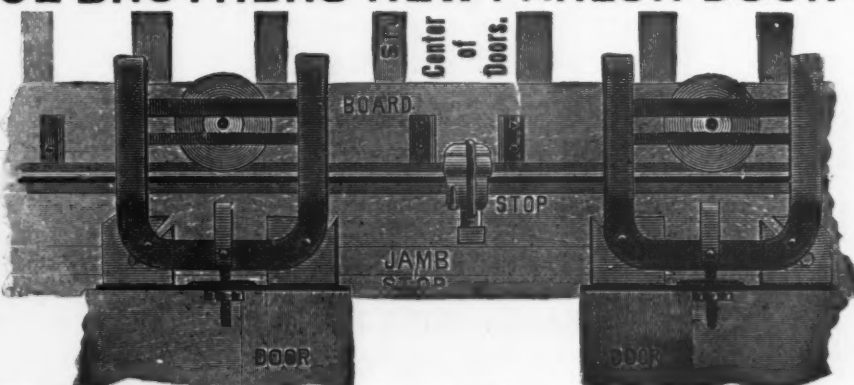
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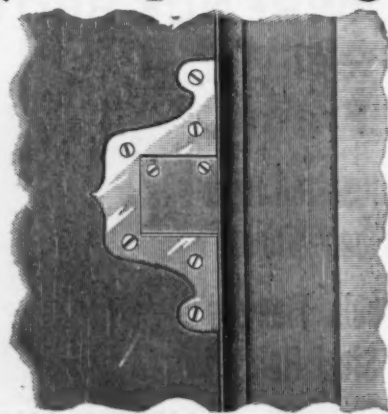
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Equalizes the pressure at all points, permitting the door to return to its initial point, slowly and easily. This is a radical departure from all other similar constructions. The door once adjusted is always in line. There are no unsightly springs or parts visible. There's no sagging of the door possible, and many other good features embodied in the "Easy" which will commend themselves upon examination. Write for descriptive matter.

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IT WORKS BOTH WAYS

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Closes the door without violent oscillation
Door cannot sag.
Holds door in perfect alignment when closed.
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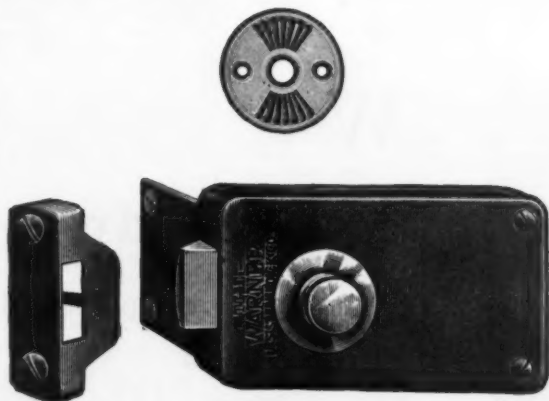


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No. 200 SERIES.

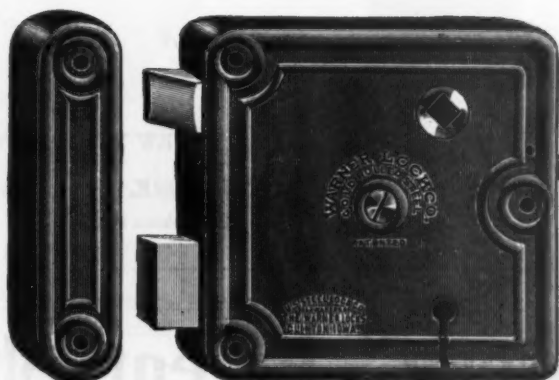
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The "Warner" Iron Bolt Rim Knob Lock.

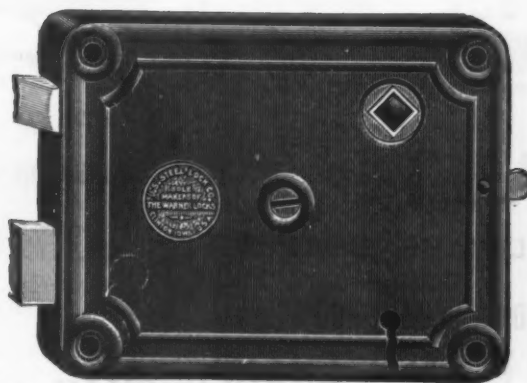
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No. 1899—Iron Bolts and Malleable Iron Keys.
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No. 1155. HORIZONTAL RIM LOCK.

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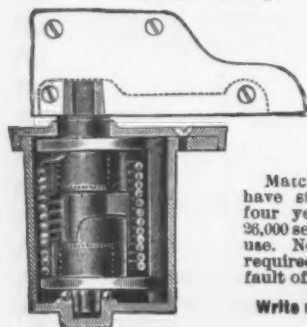
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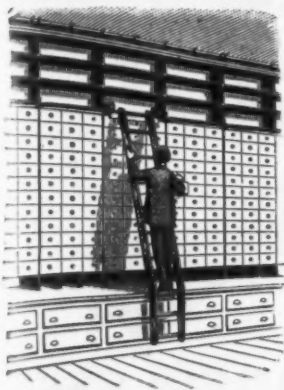
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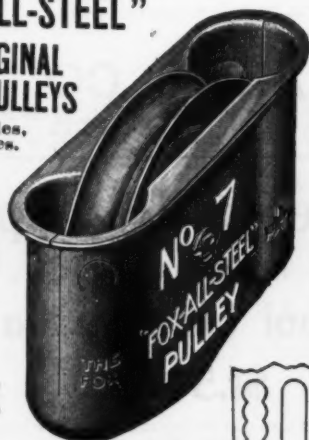
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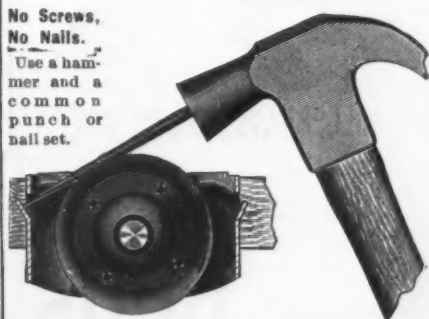
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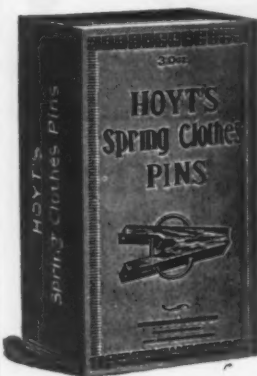
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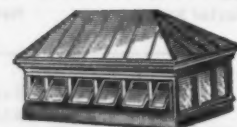
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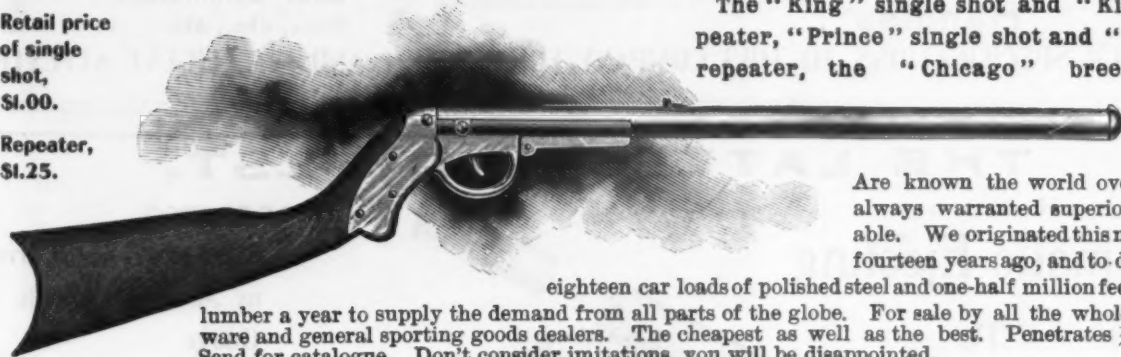
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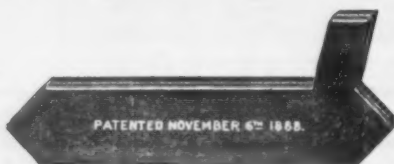
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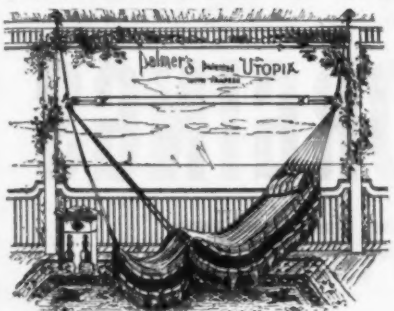
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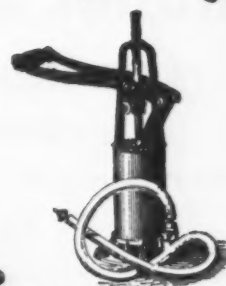
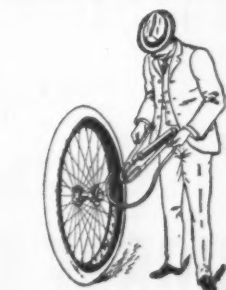
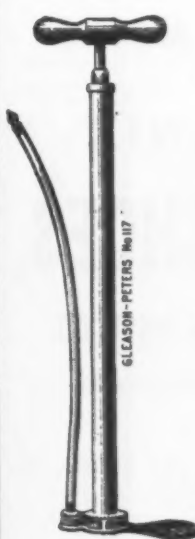
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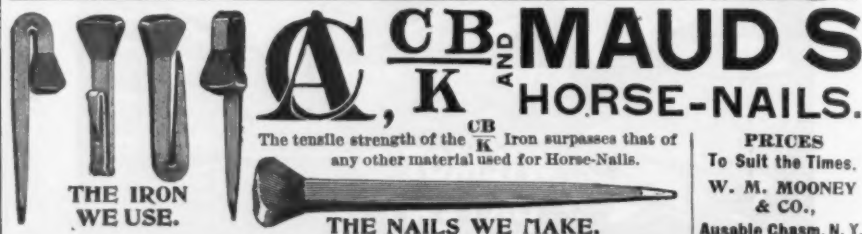
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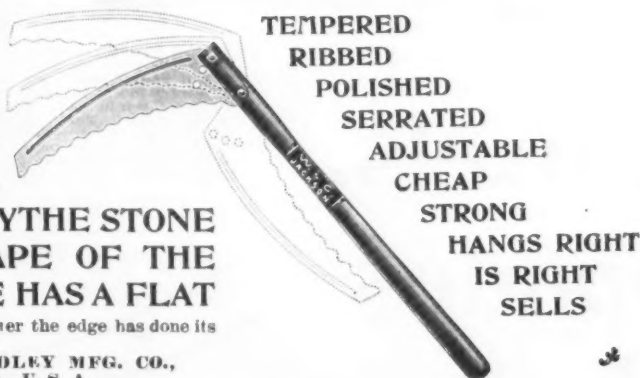
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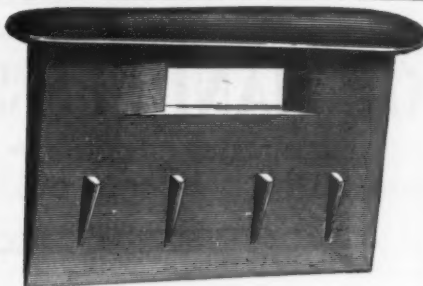
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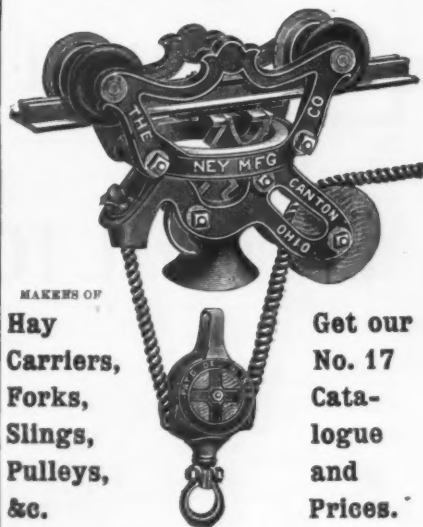
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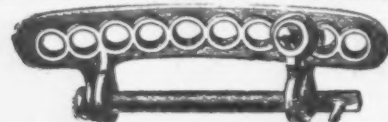
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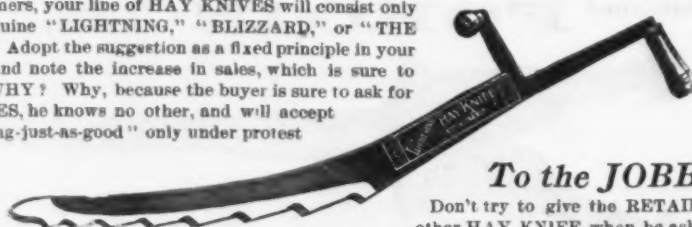
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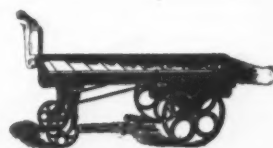
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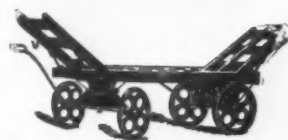
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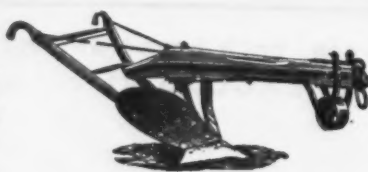
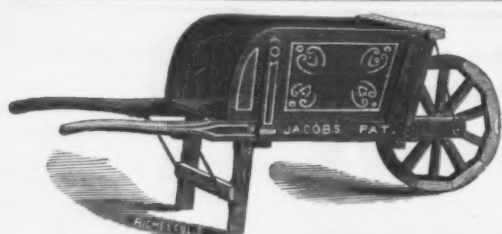
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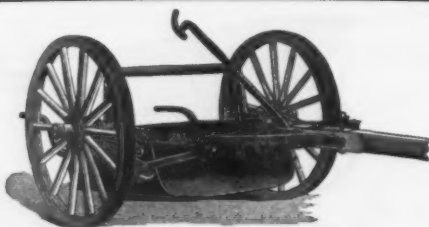
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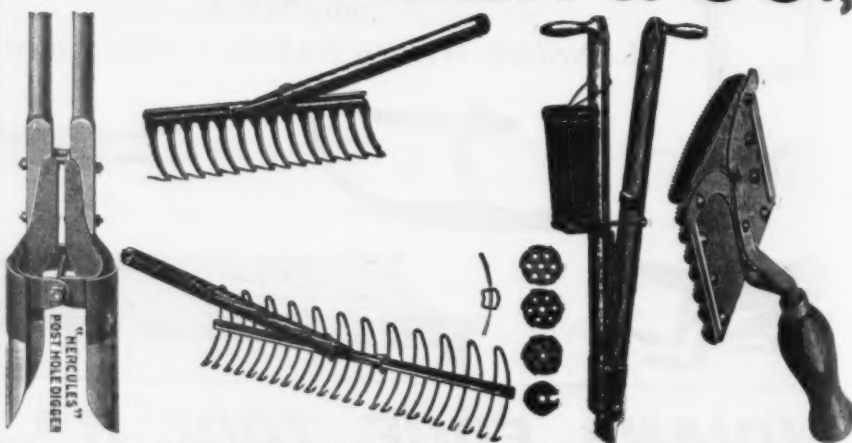
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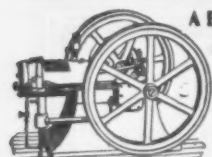


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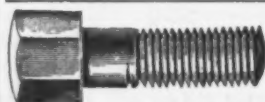


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American Tool Works Co. 85	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Ames Sword Co. 84	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Ansonia Brass & Copper Co. 2	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Arcade File Works. 145	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Arcade Malleable Iron Co. 37	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Arcade Mfg. Co. 10	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Armstrong Bros. Tool Co. 130	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Armstrong, K. S. & Bro. 109	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Asher, A. 108	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Ashland Steel Co. 27	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Ashton Valve Co. 43	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
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Atlas Machine Co. 123	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Atlas Pump Co. 108	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
Atlas, L. C. & Co. 123	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
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Atlas Mfg. Co. 123	Best, L. 63	Chisholm & Moore Mfg. Co. 127	Diamond Tack & Nail Wks. 22	Erle & Schenck. 14	Ferracuta Mch. Co. 82	Globe-Wernicke Co. 156	Hammer & Co. 150	Jones & Laughlin, Ltd. 41	Jones & Lamson Machine Co. 92	Kilpatrick & Sons. 22	
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 Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.
Air Moving Machinery
 Howard & Morse, 45 Fulton St., N. Y.

Air Rifles
 Markham Air Rifle Co., Plymouth, Mich.

Alarm Tills
 Tucker & Dorsey Mfg. Co., Indianapolis.

Alloys
 Blackwell, G. G. Sons & Co., Ltd., Liverpool, England.

Aluminum
 Janney, Stellmets & Co., Phila., Pa.
 Pittsburgh Reduction Co., Pittsburgh.

Aluminum, Brass and Bronze
 Clark, John W., Albany, N. Y.

Aluminum Tubing
 Evans, Edward, 457 Broadway, N. Y.

Ammunition
 Peters Cartridge Co., Cincinnati, O.
 Union Metallic Cartridge Co., 313-315 Broadway, N. Y.

Annealing Boxes
 Warren City Boiler Wks., Warren, O.

Anti-Friction Metals—See *Babbitt Metal*.

Anti-Rust
 Hunter Chemical Co., Phila., Pa.

Anvils
 Chicago House Wrecking Co., Chicago.
 Gay-Budden Mfg. Co., Brooklyn, N. Y.

Arvil and Vise (Combination)
 Fulton Iron & Eng. Works, Detroit, Mich.

Apple Parers
 Goodell Co., Antrim, N. H.
 Hudson Parer Co., Leominster, Mass.
 Reading Hardware Co., Reading, Pa.

Appraisers
 American Appraisal Co., Milwaukee.

Aprons, Leather
 Hull & Hays Co., Danbury, Conn.

Arbor Press
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Arc Lamps
 General Electric Co., Schenectady, N. Y.

Architects
 Bissell, E. & Co., N. Y.

Auger Bits
 Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
 Ford Bit Co., Holyoke, Mass.
 Jennings, Russell Mfg. Co., Deep River, Conn.
 Jennings, C. E. Co., 101 Reade St., N. Y.
 Marlow, H. H. Co., Shelburne Falls, Mass.
 Pugh, Joe T., Phila., Pa.
 Snell Mfg. Co., Fiskdale, Mass.
 Tower & Lyon, 95 Chambers St., N. Y.

Automatic Machines
 Automatic Mch. Co., Bridgeport, Conn.
 Cross & Speira Machine Co., Waterbury, Conn.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Nilson, A. H. Mch. Co., Bridgeport, Ct.
 Spencer Automatic Mch. Screw Co., Hartford, Conn.

Awning Hardware
 Garland Chain Co., Rankin, Pa.

Awning Hooks
 Wheeling Hinge Co., Wheeling, W. Va.

Axe Wedges
 Woodruff, W. W. & Sons, Mt. Carmel, Ct.

Axles
 Concord Axle Co., Penacook, N. H.
 Havana Metal Wheel Co., Havana, Ill.

Babbitt Metal
 Bierz, T. & Son, St. Louis, Mo.
 Magnolia Metal Co., 263-267 West St., N. Y.
 Markle Lead Works, St. Louis, Mo.
 Merchant & Co., Inc., Philadelphia, Pa.
 Reeves, Paul S., Philadelphia, Pa.
 Shimer, H. M. & Co., Phila., Pa.
 Shumberg, L., 172 Hudson St., N. Y.

Bale Ties
 Griswold Wire Co., Braddock, Pa.
 Kliner Wire Mfg. Co., Chicago, Ill.
 Wilson, H. P. & H. F., 577-579 Tenth Ave., N. Y.

Ball Flasks
 Naugatuck Mfg. Co., Naugatuck, Conn.

Balls
 Cleveland Ball & Screw Co., Cleveland, Ohio.

Bank and Office Railing
 Ever Wire Works Co., 65 Fulton St., N. Y.

Barb Wire and Fence
 Dixon-Griswold Wire Co., Sterling, Ill.

Bar Iron
 Alden Rolling Mill, Allentown, Pa.
 American Iron & Steel Mfg. Co., Lebanon, Pa.
 American Steel Hoop Co., Battery Park Building, N. Y.
 Brown & Co., Inc., Pittsburgh, Pa.
 Iron Iron Co., Troy, N. Y.
 Union Iron & Steel Co., Muskegon, Mich.
 Consolidated Iron & Steel Co., Bristol, Pa.
 Lehigh Iron & Steel Co., Pittsburgh, Pa.
 Logan Iron & Steel Co., Burnham, Pa.
 National Steel Co., Bridgeport, O.
 Republic Iron & Steel Co., Chicago, Ill.
 Stanton Bolt & Nut Co., Scranton, Pa.
 Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
 Virginia Iron, Coal & Coke Co., Bristol, Va.-Tenn.

Barings
 Bar Hearing Co., Boston, Mass.
Best Topping Knives
 Atkins, E. C. & Co., Indianapolis, Ind.

Bellevue
 Scott, Geo. M., Chicago, Ill.

Bells and Gongs
 Bevin Bros. Mfg. Co., East Hampton, Ill., N. N. Brass Co., E. Hampton, Ct.
 Miller, Edward & Co., Meriden, Ct.
 Mossberg, Frank Co., Attleboro, Mass.
 Starr Bros. Bell Co., Easthampton, Ct.

Belt Dressing
 Dixon, Jos., Crucible Co., Jersey City, N. J.

Belt Hooks
 Bristol Co., Waterbury, Conn.
 Clay Sampling Co., Cleveland O.
 Talcott, W. O. Providence, R. I.

Belt Lacing
 Main & Co., Cleveland, O.

Belt Studs
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Belting
 Alexander Bros., 412 N. 3d, Phila., Pa.
 Ames Sword Co., Chicopee, Mass.
 Boston Belting Co., Boston, Mass.
 Locke Steel Belt Co., Bridgeport, Conn.
 Machinists' Supply Co., Rochester, N. Y.
 Peerless Rubber Mfg. Co., 16 Warren St., New York.
 Shultz Belting Co., St. Louis, Mo.

Belted Chain
 Buhl Malleable Co., Detroit, Mich.
 Jeffrey Mfg. Columbus, O.
 Link-Belt Engineering Co., Phila., Pa.

Bending Rolls
 Hertsch & Co., Cambridge City, Ind.
 Hill & Jones Co., Wilmington, Del.
 New Doty Mfg. Co., Janesville, Wis.
 Niles Tool Works Co., 136-138 Liberty St., N. Y.

Bicycles
 Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.
 Remington Arms Co., Ilon, N. Y.
 Supple Hdw. Co., Phila., Pa.

Bicycle Bells—See *Bells and Gongs*.

Bicycle Chains
 Bridgeport Chain Co., Bridgeport, Ct.

Bicycle Lamps
 Bridgeport Brass Co., Bridgeport, Conn.
 Miller, Edward & Co., Meriden, Conn.
 Plume & Atwood Mfg. Co., 29 Murray St., New York.

Bicycle Machinery
 Biles, E. W. Co., Brooklyn, N. Y.
 Draper Mch. Tool Co., Worcester, Mass.
 Garvin Mch. Co., Spring and Varick Sts., New York.
 Pratt & Whitney Co., Hartford, Conn.

Bicycle Parts
 Dixon & Buxton Stamping Co., Worcester, Mass.
 Houghton & Buxton Mfg. Co., Worcester, Mass.
 Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
 Springfield Machine Screw Co., Springfield, Mass.
 Standard Tool Co., Cleveland, O.

Bicycle Pumps
 Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.

Bicycle Spokes
 Excelsior Spoke Co., Torrington, Ct.

Bicycle Sundries
 Bevin Bros. Mfg. Co., E. Hampton, Mass.
 Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
 Hill, N. N. Brass Co., E. Hampton, Ct.
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
 Miller, Edward & Co., Meriden, Conn.
 Smith & Eggo Mfg. Co., Bridgeport, Ct.
 Supple Hdw. Co., Phila., Pa.

Bicycle Wrenches
 Springfield Drop Forging Co., Springfield, Mass.
 Star Mfg. Co., Carpentersville, Ill.

Binder Twine
 American Mfg. Co., 45 Wall St., N. Y.

Bird Cages
 Hendry, Andrew B. Co., New Haven, Conn.

Bits
 Conn. Valley Mfg. Co., Centerbrook, Ct.
 Norton Mfg. Co., Chester, Conn.
 Perry, F. H. & Co., Chester, Conn.

Bit Braces
 Mason & Parker, Winchendon, Mass.

Bits and Braces
 Fray, Jno. S. & Co., Bridgeport, Conn.

Black Plate
 American Tin Plate Co., N. Y.
 Champion Iron & Steel Co., Muskegon, Mich.

Black Forges
 Munster & Peck Mfg. Co., New Haven, Ct.

Blocks, Tackle
 Boston & Lockport Block Co., Boston.
 Cleveland Block Co., Cleveland, O.
 Fulton Iron & Eng. Wks., Detroit, Mich.
 Lane Bros. Co., Foughkeeps, N. Y.
 Union Hardware Co., Torrington, Ct.

Blowers
 American Blower Co., Detroit, Mich.
 Asher, A., 109 Liberty St., N. Y.
 Bayley, Wm. & Sons Co., Milwaukee, Wis.
 Boston Blower Co., Hyde Park, Mass.
 Buffalo Forge Co., Buffalo, N. Y.
 Champion Blower & Forge Co., Lancaster, Pa.
 Cornell, J. B. & J. M., 26th St. and 11th Ave., New York City.
 Exeter Machine Wks., Boston, Mass.
 N. Y. Blower Co., Bucyrus, O.
 Spurrivant, B. F. Co., Boston, Mass.
 Wilbraham Baker Blower Co., Phila., Pa.

Boat Hardware
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Boiler Makers' Machinery
 Scientific Bros., Worcester, Mass.

Boiler Plates
 Lukens Iron & Steel Co., Coatesville, Pa.
 Seidel & Hastings Co., Wilmington, Del.

Boiler Tubes
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
 National Tube Co., Pittsburgh, Pa.

Boilers, Steam
 Babcock & Wilcox Co., 30 Cortlandt St. Cahall Sales Dept., Pittsburgh, Pa.
 Harrison Safety Boiler Wks., Phila., Pa.
 Leffel, James & Co., Springfield, O.
 Pollock, W. B. Co., Youngstown, O.
 Watson, E. P., Elizabeth, N. J.
 Wetherill, Robt. & Co., Chester, Pa.
 Wood, Jno. Mfg. Co., Conshohocken, Pa.

Bolt Cutters
 Chambers Bros., Philadelphia, Pa.
 Helwig Mfg. Co., St. Paul, Minn.
 Porter, H. K., Boston, Mass.
 Sellers, Wm. & Co., Inc., Phila., Pa.

Bolt and Nut Machinery
 Acme Machinery Co., Cleveland, Ohio.
 Ajax Mfg. Co., Cleveland, Ohio.
 Detrick & Harvey Mch. Co., Baltimore, Md.

Bolts
 Howard Iron Works, Buffalo, N. Y.
 National Machinery Co., Tiffin, Ohio.
 Reliance Mch. & Tool Co., Cleveland, O.
 Webster & Perks Tool Co., Springfield, Ohio.

Bores
 American Iron & Steel Mfg. Co., Lebanon, Pa.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Franklin-Moore Co., Winsted, Conn.
 Hall's Sam'l Sons, 229 W. 10th St., N. Y.
 Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

Boring Machines
 National Elastic Nut Co., Milwaukee, Wis.
 Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.

Boring and Turning Mills
 Port Chester Bolt & Nut Co., Port Chester, N. Y.

Box Fixtures
 Rhode Island Tool Co., Providence, R. I.
 Rockford Bolt Works, Rockford, Ill.
 Seranton Bolt & Nut Co., Seranton, Pa.
 Shelton Co., Birmingham, Conn.

Box Straps and Corners
 Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

Boxes, Hdw. Shelf, &c.
 Green, A. H. & Co., 22 Park Place, N. Y.
 Jones, Jesse, Paper Box Co., Phila., Pa.
 Jones, C. P., Revenswood, W. Va.

Brackets, Shelf
 Atlas Mfg. Co., New Haven, Conn.
 Griffin Mfg. Co., Allegheny, Pa.

Brass and Copper
 Ansonia Brass & Copper Co., 99 John St., N. Y.
 Bridgeport Brass Co., Bridgeport, Ct.
 Davol, John & Sons, 100 John, N. Y.
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
 Plume & Atwood Mfg. Co., 29 Murray St., N. Y.

Brass and Copper Rods
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Brass and Copper Wire
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Brass Butt Hinges
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Brass Butts
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Brass Founders
 Clark, John W., Albany, N. Y.
 Crann, Wm. & Sons & E. B. Co., Philadelphia, Pa.
 Reeves, Paul S., Philadelphia, Pa.
 Ryan, J. J. & Co., Chicago, Ill.

Brass Goods
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Brass and Iron Jack Chains
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Bread Knives
 Hartzell, Emmert, Fairfield, Pa.

Bread Drills
 Fray, Jno. S. Co., Bridgeport, Conn.

Bridge Builders
 American Bridge Co., East Berlin, Ct.
 Boston Bridge Works, Boston, Mass.
 Easter Bridge & Structural Co., Worcester, Mass.
 Illinois Steel Co., Chicago, Ill.
 New England Structural Co., Boston, Mass.
 Scaife, Wm. B. & Sons, Pittsburgh, Pa.

Bronze, Manganese
 Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

Brown, Tain
 Ansonia Bronze & Copper Co., 99 John St., N. Y.

Brooms and Brushes
 Osborn Mfg. Co., Cleveland, O.

Bulldozers
 Williams, White & Co., Moline, Ill.

Bung Spout
 Middleton & Co., Phila., Pa.

Burners, Acetylene Gas
 Drake Acetylene Apparatus Co., Cleveland, O.

Butchers' Saws
 Diston, Henry & Sons, Inc., Phila., Pa.
 Goodell-Pratt Co., Greenfield, Mass.
 Jennings, C. E. & Co., 101 Reade St., N. Y.

Butchers' Tools
 Chaffin, John & Sons, 35-39 Cliff St., N. Y.

Butts and Hinges—See *Hinges*.

Buyers' System
 Folding Paper Box Co., So. Bend, Ind.

Calibers and Dividers
 Starrett, L. S. Co., Athol, Mass.
 J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

Car Springs
 Scott, Chas. Spring Co., Phila., Pa.

Car Wheels
 Ramapo Car Wheel Co., Ramapo, N. Y.

Carbide of Silicon
 Carborundum Co., Niagara Falls, N. Y.

Carborundum Grains
 Carborundum Co., Niagara Falls, N. Y.

Carborundum Wheels
 Carborundum Co., Niagara Falls, N. Y.

Card Indexes
 Globe Wernicke Co., Cincinnati, O.

Carriage Hardware
 Atlas Bolt & Screw Co., Cleveland, O.
 Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.
 Clapp, E. D. Mfg. Co., Auburn, N. Y.
 Eccles, Richard, Auburn, N. Y.
 Seranton Forging Co., Seranton, Pa.

Carriage and Wagon Springs
 Rowland, Wm. & Harvey, Phila., Pa.

Cars
 Atlas Bolt & Screw Co., Cleveland, O.
 Sheffield Car Co., Three Rivers, Mich.

Cartridges
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
 Peters Cartridge Co., Cincinnati, O.
 Union Metallic Cartridge Co., 313-315 Broadway, N. Y.

Carving Tools
 Buck, Chas., Millbury, Mass.

Case Hardening Material
 American Carburizing Co., Jersey City, N. Y.

Cash Recorders
 Hough Cash Recorder Co., Indian Orchard, Mass.
 Whiting Mfg. Co., Northboro, Mass.

Casters
 Standard Caster & Wheel Co., 316-326 E. 2d St., N. Y.
 Tucker & Dorsey Mfg. Co., Indianapolis.

Castings, Atlas Metal
 Ferro-Carbon Castings Co., Phila., Pa.

Castings, Brass, Bronze and Copper
 Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
 Chapman, J. B. & Co., Springfield, Mass.
 Cramp, Wm. & Sons & E. B. Co., Philadelphia, Pa.
 Nolte Brass Co., Springfield, O.
 Ryan, J. J. & Co., Chicago, Ill.
 West Side Foundry Co., Troy, N. Y.

Castings, Finished
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.

Castings, Iron
 Barney & Reed Mfg. Co., Boston, Mass.
 Baugh Mch. Tool Co., Springfield, Mass.
 Booth, The Lloyd Co., Youngstown, O.
 Bayley, Wm. & Sons Co., Milwaukee.
 Cheney, S. & Son, Manlius, N. Y.
 Chisholm & Moore Mfg. Co., Cleveland.
 Clark, John W., Albany, N. Y.
 Codling Mfg. Co., Bristol, Conn.
 Coleman Hardware Co., Chicago, Ill.
 Crane, Wm. M. Co., 131 Broadway, N. Y.
 Diamond Drill & Mch. Co., Birdsboro, Pa.

Castings, Steel
 Farrel Fdry & Mch. Co., Ansonia, Ct.
 Forest City Foundry & Mfg. Co., Cleveland, Ohio.
 Hennessey Foundry Co., Springfield, O.
 Livermore, H. F., Boston, Mass.
 Lombard Iron Works & Supply Co., Augusta, Ga.
 Lorain Foundry Co., Lorain, Ohio.
 McLain, J. H. Co., Canton, O.
 New Albany Mfg. Co., New Albany, Ind.
 New Brunswick Fdry. Co., New Brunswick, N. J.
 Norwalk Pattern & Mfg. Co., So. Norwalk, Conn.
 Palmers and De Mooy Foundry Co., Cleveland, O.
 Phila. Roll & Mch. Co., Philadelphia, Pa.
 Ramapo Car Wheel Co., Ramapo, N. Y.
 Randolph Iron Co., Brooklyn, N. Y.
 Sessions Foundry Co., Bristol Conn.
 Smith & Caffrey, Syracuse, N. Y.
 Spencer's I. S. Sons, Guilford, Conn.
 Standard Fdy. & Mfg. Co., Cleveland, O.
 U. S. Cast Iron Pipe & Foundry Co., Phila., Pa.
 West Side Foundry Co., Troy, N. Y.
 Wetherill, Robert & Co., Chester, Pa.
 Wheeling Mold & Fdry. Co., Wheeling, W. Va.
 Youngstown Fdry. & Mch. Co., Youngstown, O.

Castings, Malleable
 Acme Steel and Mill Iron Works, Buffalo, N. Y.
 Arcade Mill Iron Co., Worcester, Mass.
 Hammer & Co., Brantford, Conn.
 Illinois Mill Iron Co., Chicago, Ill.
 Jarecki Mfg. Co., Erie, Pa.
 York Mfg. Co., York, Pa.

Castings, Steel
 Arcade Malleable Iron Co., Worcester, Mass.
 Bethlehem Steel Co., So. Bethlehem, Pa.
 Chester Steel Casting Co., Phila., Pa.
 Chrc. ne Steel Works, Brooklyn, N. Y.
 Flagg, Stanley G. & Co., Phila., Pa.
 Lima Steel Castings Co., Lima, O.
 Livermore, Homer F., Boston, Mass.
 Morris, F. Hollingsworth, Phila., Pa.

- New England Steel Castings Co., Philadelphia, Pa.
Odis Steel Co., Ltd., Cleveland, Ohio
Shaw, E. M., Providence, R. I.
Union Steel Casting Co., Pittsburgh, Pa.
- Catalogue Files**
Folding Paper Box Co., So. Bend, Ind.
- Ceilings, Metal**
Youngstown Iron & Steel Roofing Co., Youngstown, O.
- Cements, Iron**
Smooth On Mfg. Co., Jersey City N. J.
- Cement Workers' Tools**
Ideal Tool Co., Indianapolis, Ind.
- Chain**
Bradlee & Co., Philadelphia.
Bridgeport Chain Co., Bridgeport, Ct.
Garland Chain Co., Rankin, Pa.
Hale Bros., Worcester, Mass.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Jenkins Iron & Tool Co., Howard, Pa.
Link-Belt Engineering Co., Phila., Pa.
Locke Steel Belt Co., Bridgeport, Conn.
McKay J. & Co., Pittsburgh, Pa.
Onelda Community, Ltd., Niagara Falls, and rd Chain Co., Pittsburgh, Pa.
- Chain Plants**
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- Chemicals**
Kimber & Amend, New York.
- Cherry Stokers**
Enterprise Mfg. Co., Philadelphia, Pa.
Goodell Co., Antrim, N. H.
- Chisels**
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
Jennings, C. F. Co., 101 Reade St., N. Y.
White, L. & J. Co., Buffalo, N. Y.
- Christmas Tree Holders**
Donnelly, John H., Branford, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
- Chucks**
Cushman Chuck Co., Hartford, Conn.
Doehler Mfg. Co., Middletown, Conn.
Goodell Fratt Co., Greenfield, Mass.
Hogson & Pettis Mfg. Co., New Haven.
Holland Mfg. Co., Erie, Pa.
Horton, E. & Son Co., Windsor Locks, Ct.
Ideal Machine Works, Hartford, Conn.
Pratt Chuck Co., Frankfort, N. Y.
Skinner Chuck Co., New Britain, Conn.
Standard Tool Co., Cleveland, O.
Union Mfg. Co., 103 Chambers, N. Y.
Whitton, D. E. Mach. Co., New London.
- Cider Mills**
Whit-hurst, R. W. & Co., Norfolk, Va.
- Circular Sawing Machines**
Kiddler, R. E., Worcester, Mass.
- Clamps**
Beale, C. H. & Co., Chicago, Ill.
Hall, Thos., Brooklyn, N. Y.
Hammer & Co., Branford, Conn.
- Clevis**
Krusse Kross Klevis Co., Higginsville, Mo.
- Clipping Machines**
Amer. Shearer Mfg. Co., Nashua, N. H.
Chicago Flexible Shaft Co., Chicago, Ill.
McCoy, Jos. F. Co., 26 Warren St., N. Y.
Wibusch & Hilger, Ltd., 9-15 Murray St., N. Y.
- Clock - Gold Plated**
B-n-d-ct, M. S. J. Co., E. Syracuse, N. Y.
- Clothes Dryers**
Hill Dryer Co., Worcester, Mass.
- Clothes Line Hook**
Wilson, E. H. & Co., Allston, Mass.
- Clothes Pins**
Clark, J. R. Co., Minneapolis, Minn.
U. S. Clothes Pin Co., Montpelier, Vt.
- Coal**
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.
Washington Coal & Coke Co., Dawson, Pa.
Wister, Francis, Philadelphia, Pa.
- Coal Cars**
Lansing Wheelbarrow Co., Lansing, Mich.
- Coal Picks**
Jenkins Iron & Tool Co., Howard, Pa.
- Coal Shutes**
Lansing Wheelbarrow Co., Lansing, Mich.
- Coke**
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.
Beasmer Coke Co., Pittsburgh, Pa.
Cherry Valley Iron Co., Pittsburgh, Pa.
Dimmick, J. K. & Co., Phila., Pa.
Frick, H. C. Coke Co., Pittsburgh, Pa.
Houston, C. & Co., Philadelphia, Pa.
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Virginia Iron, Coal & Coke Co., Bristol, Va.-Tenn.
Washington Coal & Coke Co., Dawson, Pa.
Wister, Francis, Philadelphia, Pa.
- Colleges**
Michigan College of Mines, Houghton, Mich.
- Compressed Air Machinery**
Phila. Pneumatic Tool Co., Phila. Pa.
- Conductor Pipe**
Berger Bros. Co., Philadelphia, Pa.
- Conveying Machinery**
Aultman Co., Canton, Ohio.
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
California Wire Works, San Francisco.
Hunt, C. W. Co., W. New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.
- Cooking Utensils**
Cleveland Stamping & Tool Co., Cleveland, O.
- Copper**
Hendricks Bros., 49 Cliff, N. Y.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
United Metals Selling Co., 11 Broadway, N. Y.
- Copper Hammers**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Rail Heads**
American Steel & Wire Co., Chicago, Ill.
- Copper Rivets and Burrs**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Tacks and Nails**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Wire, Bare and Insulated**
American Steel & Wire Co., Chicago, Ill.
- Cordage**
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.
- Cordage Machinery**
Hoover & Gamble Co., Miamisburg, O.
- Core Ovens**
Millett Core Oven Co., Brighton, Mass.
- Cork Screws and Cork Pullers**
Erie Specialty Co., Erie, Pa.
- Corn Hooks**
Swithington & Cooley Mfg. Co., Jackson, Mich.
- Corn Huskers**
Wilcox Mfg. Co., Aurora, Ill.
- Cornish Brakes**
Bertech & Co., Cambridge City, Ind.
- Corrugated Iron and Steel**
Garland Iron & Steel Roofing Co., Cleveland, O.
McCullough Iron Co., Wilmington, Del.
Scaife, Wm. B. & Sons, Pittsburgh.
- Corundum**
National Abrasive Mfg. Co., Phila., Pa.
- Cover Plate Machines, Automatic**
F. B. Co., New Haven, Conn.
- Cotton Ties**
American Steel Hoop Co., Battery Park Building, N. Y.
- Counting Machines**
Durant W. N. Milwaukee Wis.
- Couplings, Compression**
Sennett, Geo. B. Co., Youngstown, O.
- Cow Ties**
Garland Chain Co., Rankin, Pa.
Onelda Community, Ltd., Niagara Falls.
- Cranes**
Brown Hoisting & Conveying Mch. Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland.
Cleveland Crane & Car Co., Cleveland, O.
Niles Tool Works Co., 136-138 Liberty St., N. Y.
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger, Milwaukee, Wis.
Pneumatic Crane Co., Pittsburgh, Pa.
Reading Crane & Hoist Wks., Reading, Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.
- Spindel, J. G., Reading, Pa.**
Whiting Foundry Equipment Co., Harvey, Ill.
- Crayon**
Steward, D. M. Mfg. Co., Chattanooga, Tenn.
- Crucibles**
Dixon, Jos. Crucible Co., Jersey City, N. J.
- Cupolas**
Paxson, J. W. Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.
- Curry Combs**
New York Stamping Co., Brooklyn, N. Y.
- Cutlery**
Cattaraugus Cutlery Co., Little Valley, N. Y.
Chaffin, John & Sons, 85 to 89 Cliff St., N. Y.
Dame, Stoddard & Co., Boston.
Goodell Co., Antrim, N. H.
Kimball, C. J. Co., Bennington, N. H.
Northfield Knife Co., Northfield, Conn.
Parkhurst, L. D., Danielson, Conn.
Smith & Hemenway Co., 236 Broadway, N. Y.
Southington Cutlery Co., Southington, Conn.
Wibusch & Hilger, Ltd., 9 to 15 Murray St., N. Y.
- Cylinders, Air and Gas**
Harrisburg Pipe Bending Co., Harrisburg, Pa.
- Dampers**
Singer Mfg. Co., Freeport, Ill.
Williams, A. C., Ravenna, O.
- Diamond Tools**
Dickinson, Thos. L., 43 Vesey St., N. Y.
- Dies**
Adriance Mach. Works, Brooklyn, N. Y.
American Hdw. Mfg. Co., Ottawa, Ill.
Ellis, E. W. Co., Brooklyn, N. Y.
Ferracute Mach. Co., Bridgeport, N. J.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Mossberg, Frank Co., Attleboro, Mass.
Richard Mfg. Co., Bloomsburg, Pa.
Wilson & Smith, Worcester, Mass.
- Do Collars**
Union Hardware Co., Torrington, Ct.
- Door Bells - See Bells and Gongs**
- Door Checks and Springs**
Bardsley, Jos. 147 151 Baxter St., N. Y.
Larimer Mfg. Co., Pittsburgh, Pa.
Pullman Sash Balance Co., Rochester, N. Y.
Russell & Erwin Mfg. Co., New York.
- Door Holders**
Brohard Co., Phila., Pa.
Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**
Richard Mfg. Co., Bloomsburg, Pa.
Thompson, Hugh L., Waterbury, Ct.
- Draw Benches**
Richard Mfg. Co., Bloomsburg, Pa.
- Drawing Stands**
Allen, D. H. & Co., Miamisburg, O.
- Drill Grinders**
Reid, L. S. & Son, Barre, Mass.
Sellers, Wm. & Co., Inc., Phila., Pa.
Washington Shops of Worcester Polytechnic Inst., Worcester, Mass.
- Drilling Machines**
Aurora Tool Works, Aurora, Ind.
Baker Bros., Toledo, O.
Barnes, R. F. Co., Rockford, Ill.
Barnes, W. F. & John Co., Rockford, Ill.
Baugh Mch. Tool Co., Springfield, Mass.
Bement, Miles & Co., Phila., Pa.
Rickford Drill & Tool Co., Cin., Ohio.
Shard Machine Tool Co., Bridgeport, Ct.
Burnham, Geo. Co., Worcester, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Cincinnati Mch. Tool Co., Cincinnati, O.
Dallier, Thos. H. & Co., Philadelphia.
D'Amour & Littledale Mch. Co., 131 Worth St., N. Y.
Davis, W. F., Machine Co., Rochester, N. Y.
- Detrick & Harvey Mch. Co., Baltimore, Md.**
Dreses, Mueller & Co., Cincinnati, O.
Fosdick & Holloway Mach. Tool Co., Cincinnati, O.
Harrison, E. Son & Co., Phila., Pa.
Hill, Clark & Co., Boston, Mass.
Hoefler Mfg. Co., Freeport, Ill.
Prentiss Bros., Worcester, Mass.
Quint, A. D., Hartford, Conn.
Shawyer, F. B. Co., New Haven, Conn.
Snyder & Ware, So. Bend, Ind.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Slate Dwight Machine Co., Hartford, Ct.
Stow Flexible Shaft Co., Phila., Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
Woodward & Rogers, Hartford, Conn.
York, S. M. Co., Cleveland, O.
- Drilling Machines, Automatic**
Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**
Chicago Pneumatic Tool Co., Chicago, Ill.
- Drive Chains**
Link-Belt Co., Bridgeport, Conn.
- Drop Forgings**
Belden Machine Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn.
Chicago Drop Forging & Fdry. Co., Kensington, Ill.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Consolidated Railway Electric Lighting & Equipment Co., 60 Broadway, N. Y.
Eccles, Richard, Auburn, N. Y.
Indianapolis Drop Forging Co., Indianapolis, Ind.
Keystone Drop Forge Co., Philadelphia.
Kilborn & Bishop Co., New Haven, Conn.
R. I. Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
Seward, M. & Son Co., New Haven, Ct.
Springfield Drop Forging Co., Springfield, Mass.
Strieby & Foote Co., Newark, N. J.
Transeau & Williams Co., Alliance, O.
Williams, J. H. & Co., Brooklyn, N. Y.
Wyman & Gordon, Worcester, Mass.
- Drop Hammers**
Billings & Spencer Co., Hartford, Conn.
Merrill Bros., Brooklyn, N. Y.
Williams, White & Co., Moline, Ill.
- Drop Presses**
Manville, E. J. Mch. Co., Waterbury, Ct.
Minner & Peck Mfg. Co., New Haven, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Vulcan Iron Works, Chicago, Ill.
- Drilling Machines**
Aurora Tool Works, Aurora, Ind.
Dreses, Mueller & Co., Cincinnati, O.
- Dumb Waiters**
Energy Elevator Co., Philadelphia, Pa.
Spindel, J. G., Reading, Pa.
Stearns Mfg. Co., Newark, N. J.
Variety Machine Co., Warsaw, N. Y.
- Dump Cars**
Atlas Hoist & Screw Co., Cleveland, O.
- Dynamoes**
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
Harrison & Van Winkle Co., Newark, N. J.
Mayer, M. M., Electric Co., 2nd Ave. and 121st St., N. Y.
Stewart Electric Co., Cincinnati, O.
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
Zeigler & Levett & Loeb Co., 326-330 W. 23rd St., New York.
- Eave Troughs**
Kanneberg Rfg. Co., Canton, O.
- Eave Trough Hangers**
Berger Bros. Co., Philadelphia, Pa.
Hearley Mach. ne Variety Iron & Tool Works, Toledo, O.
Oatman Bros., Medina, O.
- Edge Tools**
Buck, Chas., Millbury, Mass.
Buck Bros., Millbury, Mass.
Ferro-Carbon Castings Co., Phila., Pa.
White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters**
Lyon, Nelson, Albany, N. Y.
Standard Co., Boston, Mass.
Taolin Mfg. Co., Forestville, Conn.
- Egg Opener**
Hartigan, W. R., Collinsville, Ct.
- Electric Belts and Supplies**
Strander, W. R. & Co., 24 Fulton St.
- Electric Controllers**
Electric Controller & Supply Co., Cleveland, O.
- Electric Lighting and Power Apparatus**
Electric Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
- Electrical Apparatus**
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Electrical Machinery**
Stewart Electric Co., Cincinnati, O.
- Electrical Supplies**
Mianus Electric Co., Mianus, Conn.
- Elevators, Makers of**
Eastern Machinery Co., New Haven, Ct.
Energy Elevator Co., Philadelphia, Pa.
Franklin Mach. Works, St. Paul, Minn.
Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.
Spindel, J. G., Reading, Pa.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati, O.
- Elevator Buckets**
Clark, W. J. & Co., Salem, O.
Cleveland Elevator Bucket Co., Cleveland, O.
- Elevator Enclosures and Cabs**
Ludlow Saylor Wire Co., St. Louis, Mo.
- Emery**
Tanite Co., Stroudsburg, Pa.
- Emery Grinding Machinery**
Webster & Perks Tool Co., Springfield, Ohio.
- Emery Wheels**
Safety Emery Wheel Co., Springfield, O.
Springfield Mfg. Co., Bridgeport, Conn.
Star Corundum Wheel Co., Detroit.
Sterling Emery Wheel Co., Tiffin, O.
Tanite Co., Stroudsburg, Pa.
Vitified Emery Wheel Co., Westfield, Mass.
- Emery Wheel Dresser**
Chicago Screw Co., Chicago, Ill.
Dickinson, Thos. L., 43 Vesey St., N. Y.
- Enamelled Ware**
Bellwire Stamping Co., Harvey, Ill.
- Engineers and Contractors**
Aiken, Henry, Pittsburgh, Pa.
Erikson, Edw. E., Pittsburgh, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Heyl & Patterson, Pittsburgh, Pa.
Huber, S. V. Co., Pittsburgh, Pa.
Kay, G. Ashton, 238 Broadway, N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Kennedy, Walter, Pittsburgh, Pa.
Lamond, David, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
McClure, G. W. Son & Co., Pittsburgh, Pa.
Miller Engineering Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Penna. Engineering Wks., New Castle, Penna.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Smythe, S. K. Co., Inc., Pittsburgh, Pa.
Swindle, W. & Bros., Pittsburgh, Pa.
Thompson, Hugh L., Waterbury, Ct.
Wellman Seaver Engineering Co., Cleveland, O.
Whiting Foundry Equipment Co., Harvey, Ill.
- Engines, Gas**
Metz, Aug., 136-138 Mott St., N. Y.
Northern Engineering Works, Detroit, Mich.
Ruser, J. W. Mfg. Co., Buffalo, N. Y.
- Engines, Gasoline**
Charter Gas Engine Co., Sterling, Ill.
Ruser, J. W. Mfg. Co., Buffalo, N. Y.
Webster Engine Works, Freeport, Ct.
Webster Gas & Gasoline Engine Co., Kansas City, Mo.
Watkins, F. M., Cincinnati, O.
- Engines, Kerosene**
Metz, Aug., 136-138 Mott St., N. Y.
- Engines, Steam**
Ailes, E. P. Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Filer & Stowell Co., Milwaukee, Wis.
Lefel, James & Co., Springfield, O.
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.
Sennett Geo. B. Co., Youngstown, O.
Southwick Fdry. & Mch. Co., Philadelphia, Pa.
Sturtevant, B. F. Co., Boston, Mass.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Wetherill, Robert & Co., Chester, Pa.
- Engines, M. r. r. e**
Lake City Engineering Co., Erie, Pa.
- Engines, Second Hand**
Everson, R. M., Pittsburgh, Pa.
- Enkravers**
Sugford, W., Hartford, Conn.
- Expanding Mandrels**
LeCount, Wm. G., So. Norwalk, Conn.
- Expansion Belts**
Church, Isaac Toledo, O.
Evans, F. H., Brooklyn, N. Y.
McCauley Hanger Mfg. Co., 333-343 W. 23d St., N. Y.
- Newhall, Henry B. Co., N. Y.**
Seaman D. C. & Co., Philadelphia, Pa.
Steward & Komaine Mfg. Co., Phila., Pa.
- Exporters**
Shelby & Co., London, Eng.
- Farriers' Tools**
Heller Bros. & Co., Newark, N. J.
- Faucets**
Litchfield, J. M., 105 Beekman St., N. Y.
McKenna Brass Co., Ltd., Pittsburgh, Pa.
- Faucets, Wooden**
Boston & Lockport Block Co., Boston.
Sommer's John, Son, Newark, N. J.
- Feed Cutters**
Silver Mfg. Co., Salem, O.
- Feed Water Heaters and Purifiers**
Harrisburg Pipe Bending Co., Harrisburg, Pa.
Harrison Safety Boiler Works, Philadelphia, Pa.
Kelly, B. F. & Son, 91 Liberty St., N. Y.
National Pipe Bending Co., New Haven.
Patterson, F. L., 136 Liberty St., N. Y.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock, Oil Pipe Co., Hartford, Ct.
- Fencing, Iron and Wire**
Adam, W. J., Joliet, Ill.
American Steel & Wire Co., Chicago, Ill.
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
Dwiggins Wire Fence Co., Anderson, Ind.
Ellis & Halfenbarger, Indianapolis, Ind.
Front Wire Fence Co., Cleveland, O.
Gilbert & Bennett Mfg. Co., 42 Cliff St.
Hartman Mfg. Co., 309 Broadway, N. Y.
Kilmer Wire Mfg. Co., Chicago, Ill.
Kokomo Fence Mch. Co., Kokomo, Ind.
Ludlow Saylor Wire Co., St. Louis, Mo.
Ornamental Iron & Wire Co., Chattanooga, Tenn.
Rosenau W. ven Wire Fence Co., Roseman, N. Y.
Stewart Iron Works, Cincinnati, Ohio.
Up-to-date Mfg. Co., Terre Haute, Ind.
- Ferro-Chromium**
Wilson Aluminum Co., 99 Cedar Street, N. Y.
- File Cutting Machinery**
Hess Machine Works, Phila., Pa.
- Files and Rasps**
Manufacturers of the Works, Anderson, Ind.
Barrett, G. & H. Co., 41 & 43 Richmond Phila.
Diston, Henry & Sons, Inc., Phila., Pa.
Heller Bros. Co., Newark, N. J.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.
Stokes Bros. Mfg. Co., Freehold, N. J.
- Filing Cabinets**
Globe-Wernicke Co., Cincinnati, O.
- Filters**
Scaife, Wm. B. & Sons, Pittsburg, Pa.

Finished Castings

Franklin A. H. Mfg. Co., Syracuse, N. Y.
Fire Brick
 Sawyer, Cyrus, Philadelphia, Pa.
 Gardner Bros., Cumberland, Md.
 Hawk, W. H. Fire Brick Co., Mt. Union, N. Y.
 Sawyer, H. & Son, 420 E. 3d, N. Y.
 Grandeur Fire Brick Co., Troy, N. Y.
 Presbury Fire Brick Co., Taunton, Mass.
 Stonen Island Clay Co., Woodbridge, Va.
 Valentine, M. D. & Bro. Co., Woodbridge, Va.

Fire Place Goods

Hewes, S. M. Co., Boston, Mass.

Fire Sets

Troy Nickel Works, Troy, N. Y.

Fishing Tackle

Dane, Stoddard & Co., Boston, Mass.

Flanged Fittings

Lathrop Steel Co., Phila., Pa.

Flexible Shafting

Chicago Flexible Shaft Co., Chicago, Ill.

Flint and Emery Paper

Maeder, Adamson & Co., Phila., Pa.

Floor and Ceiling Plates

Codding Mfg. Co., Bristol, Conn.

Floor Hinge

Lawson Mfg. Co., Milwaukee, Wis.

Flue Cleaners

Jackson Flue Scraper Co., Jackson, Mich.

Flue Killers

Bislow, J. F., Worcester, Mass.

Flue Traps

Montgomery, R. H. & Co., Decatur, Ill.

Foot Power Emery Wheels

Buffalo Emery Wheel Co., Buffalo, N. Y.

Foot Pumps

Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.

Foot Rests

Star Heel Plate Co., Newark, N. J.

Forges, Portable, &c.

Bradley Co., Syracuse, N. Y.

Foundry Blowers

Champion Blower & Forge Co., Lancaster, Pa.

Foundry Iron and Steel

Sturtevant, B. F. Co., Boston, Mass.

Foundry Lamps

Forest City Fdy. & Mfg. Co., Cleveland, Pa.

Foundry Supplies

Cleveland Facing Mill Co., Cleveland, O.

Foundry Tools

Whittington & Cooley Mfg. Co., Jackson, Mich.

Foundry Traps

Montgomery, R. H. & Co., Decatur, Ill.

Foundry Vents

Sturtevant, B. F. Co., Boston, Mass.

Foundry Wheels

Buffalo Emery Wheel Co., Buffalo, N. Y.

Foundry Yokes

Sturtevant, B. F. Co., Boston, Mass.

Foundry Yokes

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Sturtevant, B. F. Co., Boston, Mass.

Bultman, F. H. & Co., Cleveland, O.
 Monce, S. G., Unionville, Conn.
 Smith & Hemenway Co., 296 Broadway, N. Y.

Glass Cutting Boards

Larkin Rule Co., Saginaw, Mich.

Glue

Baeder, Adamson & Co., Phila., Pa.

Golf Goods

Bridge-ort Gun Implement Co., 817 Broadway, N. Y.

Grain & Mill Tubes

Hart, R. R., Greenwich, O.

Grates, Rocking

Sennett, Geo. P. Co., Youngstown, O.

Grease, Axle

Snow Flake Axle Grease Co., Boston.

Grinding and Polishing Mchs.

American Emery Wheel Works, Providence, R. I.

Grinding and Polishing Mchs.

Barnes, W. F. & John Co., Rockford, Ill.

Grinding and Polishing Mchs.

Bealy, Chas. H. & Co., Chicago, Ill.

Grinding and Polishing Mchs.

Brown & Sharpe Mfg. Co., Providence, R. I.

Grinding and Polishing Mchs.

Bulldozer Foundry, Providence, R. I.

Grinding and Polishing Mchs.

Cincinnati Milling Mach. Co., Cincinnati, O.

Grinding and Polishing Mchs.

Gorton, Geo. Mach. Co., Racine, Wis.

Grinding and Polishing Mchs.

Landis Tool Co., Waynesboro, Pa.

Grinding and Polishing Mchs.

Northampton Emery Wheel Co., Leeds, Mass.

Grinding and Polishing Mchs.

Norton Emery Wheel Co., Worcester, Mass.

Grinding and Polishing Mchs.

Safety Emery Wheel Co., Springfield, O.

Grinding and Polishing Mchs.

Springfield Mfg. Co., Bridgeport, Conn.

Grinding and Polishing Mchs.

Star Corundum Wheel Co., Detroit, Mich.

Grinding and Polishing Mchs.

Tank Co., Stroudsburg, Pa.

Grinding and Polishing Mchs.

Universal Mach. Co., Providence, R. I.

Grinding and Polishing Mchs.

Grindstones

Cleveland Stone Co., Cleveland, O.

Grinding and Polishing Mchs.

Grubbing Machine

New Century Mfg. Co., 48 E. 8th St., N. Y.

Grinding and Polishing Mchs.

Gun Implements

Union Hardware Co., Torrington, Conn.

Grinding and Polishing Mchs.

Harrington & Richardson Arms Co., Worcester, Mass.

Grinding and Polishing Mchs.

Marlin Fire Arms Co., New Haven, Ct.

Grinding and Polishing Mchs.

Remington Arms Co., 815 Broadway, New York

Grinding and Polishing Mchs.

Gymnasium Apparatus

Narragansett Mch. Co., Providence, R. I.

Grinding and Polishing Mchs.

Hack Saws

Disston, Henry & Sons, Inc., Phila., Pa.

Grinding and Polishing Mchs.

Goodell-Pratt Co., N. Y.

Grinding and Polishing Mchs.

Springfield Machine Screw Co., Springfield, Mass.

Grinding and Polishing Mchs.

Starrett, L. S. Co., Athol, Mass.

Grinding and Polishing Mchs.

Hack Saw Frames

Miller Falls Co., 25 Warren St., N. Y.

Grinding and Polishing Mchs.

Hammer Mold

Field, C. H., Providence, R. I.

Grinding and Polishing Mchs.

Hammers

Heller Bros. Co., Newark, N. J.

Grinding and Polishing Mchs.

Logan & Strobbridge Iron Co., New Brighton, Pa.

Grinding and Polishing Mchs.

Hammers, Pneumatic

Chicago Pneumatic Tool Co., Chicago, Ill.

Grinding and Polishing Mchs.

Standard Pneumatic Tool Co., Chicago, Ill.

Grinding and Polishing Mchs.

Hammers

Palmer, I. E., Middletown, Conn.

Grinding and Polishing Mchs.

Bicknell Hdw. Co., Janesville, Wis.

Grinding and Polishing Mchs.

Costello, J. E. Machine Wks., Brooklyn, N. Y.

Grinding and Polishing Mchs.

Bliss, R. Mfg. Co., Pawtucket, R. I.

Grinding and Polishing Mchs.

Handles

Piqua Handle & Mfg. Co., Piqua, O.

Grinding and Polishing Mchs.

Handle Machinery

Defiance Machine Works, Defiance, O.

Grinding and Polishing Mchs.

Hangers, Burn Door

Coleman Island Perkins Horse Shoe Co., Providence, R. I.

Grinding and Polishing Mchs.

Hangers, Door

Courtn Trolley Track Mfg. Co., Holyoke, Mass.

Grinding and Polishing Mchs.

Cronk Hanger Co., Elmira, N. Y.

Grinding and Polishing Mchs.

Lane Bros., Poughkeepsie, N. Y.

Grinding and Polishing Mchs.

Louder Machinery Co., Fairfield, Iowa.

Grinding and Polishing Mchs.

McCabe Hanger Mfg. Co., 531-543 W. 22d Street, N. Y.

Grinding and Polishing Mchs.

McKinney Mfg. Co., Allegheny, Pa.

Grinding and Polishing Mchs.

New Mfg. Co., Canton, Ohio.

Grinding and Polishing Mchs.

Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

Grinding and Polishing Mchs.

Wilcox Mfg. Co., Aurora, Ill.

Grinding and Polishing Mchs.

Hangers, Shafting

Ball Bearing Co., Boston, Mass.

Grinding and Polishing Mchs.

Dodge Mfg. Co., Mishawaka, Ind.

Grinding and Polishing Mchs.

Hangers, Storm Window and

Phoenix Mfg. Co., Milwaukee, Wis.

Grinding and Polishing Mchs.

Hardware Comm'n Merchants

Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Grinding and Polishing Mchs.

Hunkerford, U. T. Brass & Copper Co., 125 W. 14th St., N. Y.

Grinding and Polishing Mchs.

Hardware Jobbers

Fritzlauff, John Fdw. Co., Milwaukee, Wis.

Grinding and Polishing Mchs.

Trout, Geo. W. & Co., Chicago, Ill.

Grinding and Polishing Mchs.

Hardware Manufacturers

Arcaide Mfg. Co., Freeport, Ill.

Grinding and Polishing Mchs.

Central Hardware Co., Phila.

Grinding and Polishing Mchs.

Coleman Hardware Co., Chicago, Ill.

Grinding and Polishing Mchs.

Logan & Strobbridge Iron Co., New Brighton, Pa.

Grinding and Polishing Mchs.

Miller Falls Co., 25 Warren St., N. Y.

Grinding and Polishing Mchs.

New Mfg. Co., Canton, Ohio.

Grinding and Polishing Mchs.

Nicol & Co., Chicago, Ill.

Grinding and Polishing Mchs.

Parker, Chas. Co., Meriden, Conn.

Grinding and Polishing Mchs.

Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Grinding and Polishing Mchs.

Russell & Erwin Mfg. Co., New York.

Grinding and Polishing Mchs.

Shepard, Sidney & Co., Buffalo, N. Y.

Grinding and Polishing Mchs.

Southington Cutlery Co., Southington, Conn.

Grinding and Polishing Mchs.

Stanton Works, New Britain, Conn.

Grinding and Polishing Mchs.

Union Mfg. Co., 103 Chambers St., N. Y.

Grinding and Polishing Mchs.

Van Wagoner & Williams Hdw. Co., Cleveland, O.

Grinding and Polishing Mchs.

Wrightsville Hdw. Co., Wrightsville, Pa.

Grinding and Polishing Mchs.

Hardware Mfrs. Agents

Graham, John H. & Co., 113 Chambers St., N. Y.

Grinding and Polishing Mchs.

Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Grinding and Polishing Mchs.

Hardware Shelving

- Lockers**
Narragansett Mch. Co., Providence, R.I.
- Locks and Knobs**
Central Hardware Co., Phila., Pa.
Norwalk Lock Co., So. Norwalk, Conn.
Reading Hdw. Co., Reading, Pa.
Russell & Erwin Mfg. Co., New York, U. S. Steel Lock Co., Chicago, 1070.
- Locomotives**
Everson, H., Pittsburgh, Pa.
- Logging Tools**
Gerlach, Peter & Co., Cleveland, Ohio.
- Lubricants**
Dixon, Jos., Crucible Co., Jersey City
Snow Flake Oil Grease Co., Boston.
- Lumbering Tools**
Morley Bros., Saginaw, Mich.
- Lunch Boxes**
Seavey Mfg. Co., Boston, Mass.
- Machinery**
Acme Machinery Co., Cleveland, Ohio.
Ajax Mfg. Co., Cleveland, Ohio.
American Tool Wks. Co., Cincinnati, O.
Bailey, U. Machinery Co., Pittsburgh, Pa.
Barues, W. F. & John Co., Rockford, Ill.
Baush Mch. Tool Co., Springfield, Mass.
Becker-Brainard Milling Mach. Co., Hyde Park, Mass.
Bliss E. W. Co., Brooklyn, N.Y.
Bowler, Geo. H., Cleveland, O.
Briggs, Marvin, 12 Broadway, N. Y.
Brown & Sharpe Mfg. Co., Providence.
Bullard Mch. Tool Co., Bridgeport, Ct.
Carlin Machinery & Supply Co., Allegheny, Pa.
Carlin's Sons, Thos., Allegheny, Pa.
Chesley Machinery Co., Havermayer Bldg., N. Y.
Cincinnati Milling Mach. Co., Cin. O.
Cincinnati Shaper Co., Cincinnati, O.
Cook, T. W. G. & Head, St. N. Y.
Cornell, J. B. & J. M., 20th St. and 11th Ave., New York City.
Davis, W. P. Machine Co., Rochester, N. Y.
Dawson, A. L. & Co., Chicago, Ill.
Detrick & Harvey Mch. Co., Baltimore, Md.
Diamond Drill & Mch. Co., Birdsboro, Pa.
Doan, J. B. & Co., Chicago, Ill.
Draper Mach. Tool Co., Worcester, Mass.
Farrel Fdry & Mch. Co., Ansonia, Conn.
Ferracute Machine Co., Bridgeport, N. J.
Fish, H. C. Machine Works, Worcester, Mass.
Fitchburg Machine Works, Fitchburg, Mass.
Garvin Machine Co., Spring and Varick Sts., N. Y.
General Supply Co., 40 John St., N. Y.
Geometric Drill Co., Westville, Conn.
Gray, Robt. J., 32 1/2 E. 132d St., N. Y.
Hannan & Finton, Springfield, Mass.
Harris Mach. Co., Minneapolis, Minn.
Hendey Machine Co., Torrington, Conn.
Hill, Henry F., Boston, Mass.
Hill, Clark & Co., Boston, Mass.
Johnson, Israel H., Jr., & Co., Phila.
Johnson, Wm. C. & Sons Mch. Co., St. Louis, Mo.
Kaiser, A. V. & Co., Phila., Pa.
Lodge & Shipley Mch. Tool Co., Cin., O.
Lund, S. T., Boston, Mass.
McCabe, J., 14 Dey Street, N. Y.
McDowell & Co., Pittsburgh, Pa.
McDowell Stocker & Co., Chicago.
Manning, Maxwell & Moore, 85-89 Liberty St., N. Y.
Manville E. J. Mach. Co., Waterbury, Ct.
Marshall & Hueschert Mch. Co., Chicago, Ill.
Moss, R. G., Frank Co., Attleboro, Mass.
National Machinery Co., Tiffin, Ohio.
New Doty Mfg. Co., Janesville, Wis.
New Haven Mfg. Co., New Haven, Conn.
New York Machine Depot, 178 Broadway, New York.
Niles, Tool Works Co., 128 Liberty St., N. Y.
Nilson, A. H. Mch. Co., Bridgeport, Ct.
Paradox Machinery Co., Chicago, Ill.
Pennsylvania Machinery Co., Phila., Pa.
Phila. Machine Tool Co., Phila., Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Pond Machine Tool Co., Plainfield, N.J.
Poole, Robt. & Son Co., Baltimore, Md.
Potter & Johnston Co., Pawtucket, R. I.
Poulter & Co., Phila., Pa.
Prest & Whitner Co., Worcester, Mass.
Prentiss Bros., Worcester, Mass.
Prentiss Tool & Supply Co., 115 Liberty St., N. Y.
Rainier & Williams, Chicago, Ill.
Reade, Wm. A. & Co., Cleveland, O.
Seyfert's Sons L. F., Philadelphia, Pa.
Sigourney Tool Co., Hartford, Conn.
Silk, Anderson Co., Cincinnati, Ohio.
Thomas & Lowe Machinery Co., Providence, R. I.
Toomey, Frank, Philadelphia, Pa.
Waterbury Felt Foundry & Mch. Co., Waterbury, Conn.
Wetherill Robert & Co., Chester, Pa.
Windsor Machine Co., Windsor, Vt.
Wisconsin Machinery Co., Milwaukee, Wis.
Wormer, C. C. Mch. Co., Detroit, Mich.
York, S. M. Co., Cleveland, O.
- Machinery, Wood Working**
American Machy Co., Grand Rapids, Mich.
Defiance Machine Wks., Defiance, O.
Fay, J. A. & Egan Co., Cincinnati, O.
- Machinery Springs**
Scott, Chas. Spring Co., Phila., Pa.
- Machinery Builders**
Chapman, J. B. & Co., Springfield, Mass.
U. S. Projectile Co., Brooklyn, N. Y.
- Machine Screws—See Screws, Machine**
- Machine Screw Work**
Spencer Automatic Mch. Screw Co., Hartford, Conn.
- Machine Tools—See Machinery**
- Machine Work**
See Machinery
- Machinists' Wrenches**
Billings & Spencer Co., Hartford, Conn.
- Machinists' Scales**
Starrett, L. S. Co., Athol, Mass.
- Machinists' Tools and Supplies**
Billings & Spencer Co., Hartford, Conn.
General Supply Co., Buffalo, N. Y.
Keston, Wm. Co., Buffalo, N. Y.
King, J. M. & Co., Waterford, N. Y.
- Manganese Bronze**
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
- Manufacturing Properties**
Hillman, J. H. Co., Pittsburgh, Pa.
- Manufacturing Sites**
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
- Southern Railway Co., Washington, D. C.**
- Measuring Machines**
Rogers, Jno. M. Bow, Gauge & Drill Wks., Gloucester City, N. J.
- Meat Choppers**
Brown, J. J., 160 Duane St., N. Y.
Enterprise Mfg. Co. of Pa., Phila., Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Streeter, N. R. & Co., Rochester, N. Y.
Woodruff, O. D., Potstow, Pa.
- Metal Brokers**
American Metal Co., 32 Broadway, N. Y.
- Metals**
Hendricks Bros., 42 Cliff St., N. Y.
Hofeler, Theo. & Co., Buffalo, N. Y.
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
Butter, A. T., 225 Broadway, N. Y.
United Metals Selling Co., 11 Broadway, N. Y.
- Metal Polish**
Hoffman, Geo. W., Indianapolis, Ind.
- Metal Spinning**
Gardner & King Co., Winsted, Conn.
- Milling Machines**
Adams Co., Dubuque, Iowa.
Becker-Brainard Milling Machine Co., Hyde Park, Mass.
Brown & Sharpe Mfg. Co., Providence.
Carter & Hakes Mach. Co., Winsted, Ct.
Cincinnati Milling Mach. Co., Cin. O.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring and Varick Sts., N. Y.
Ingersoll Milling Mach. Co., Rockford, Ill.
Niles Tool Works Co., 128-133 Liberty St., N. Y.
Shuster, F. B. Co., New Haven, Conn.
Thurston Mfg. Co., Providence, R. I.
- Mining Knives**
Bishop, Geo. H. & Co., Cincinnati, O.
Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mining Machinery**
Allis, P. Co., Milwaukee, Wis.
Rand Drill Co., 100 Broadway, N. Y.
- Mining Screens**
Harrington & King Perforating Co., Chicago, Ill.
Howard & Morse, 45 Fulton St., N. Y.
Michigan Wire Cloth Co., Detroit, Mich.
- Miter Boxes**
Thomson Bros. & Co., Lowell, Mass.
- Model Makers**
Star Mfg. Co., New Haven, Conn.
- Molding Machines**
Adams Co., Dubuque, Iowa.
Maywood Fdry & Mch. Co., Chicago.
Pridmore, Henry E., Chicago, Ill.
- Motor Fans**
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
- Motors, Air**
See Flexible Shaft Co., Phila., Pa.
- Motors, Electric**
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
Stewart Electric Co., Cincinnati, O.
Sturtevant, B. F. Co., Boston, Mass.
Wessinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Music Wire**
Feltz & Gulleaume Carlswerk, Mulheim am Rhein, Germany.
- Nail Clippers**
Cook, H. C. Co., Ansonia, Conn.
- Nail Machines**
Bennett Machine Co., Joliet, Ill.
- Nail Pullers**
Bridgeport Mfg. Co., Bridgeport, Conn.
Hagen & Reid, Troy, N. Y.
Scranton & Co., The New Haven, Conn.
Snow L. T., New Haven, Conn.
- Steam Plates, Machinery**
Livermore, Homer F., Boston, Mass.
Murdock Prior Grate Co., Boston, Mass.
- Natural Gas Pumps**
Norwalk Iron Wks. Co., So. Norwalk, Ct.
- Nickel Platers' Supplies**
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.
- Nickeloid**
American Nickeloid Co., Peru, Ill.
- Norway Shapers**
Rowland, William & Harvey, Frankford, Philadelphia.
- Novelties, Gold and Silver Plated**
Benedict, M. S. Mfg. Co., E. Syracuse, N. Y.
- Nuts—See Bolts**
- Nuts, Self-Locking**
National Elastic Nut Co., Milwaukee, Wis.
- Nut Machines**
Dunham Nut Co., Unionville, Conn.
- Oil Burning Appliances**
Rockwell, Engineering Co., 26 Cortlandt St., N. Y.
- Oil Extractor**
Reed & Curtis Mch. Screw Co., Worcester, Mass.
- Oil Heaters—See Oil Stoves**
- Oil Stones**
Pike Mfg. Co., Pike Station, N. H.
- Oil Stoves—(See Stoves Oil, Vapor and Gasoline)**
- Oilers**
Gen Mfg. Co., Pittsburgh, Pa.
Hammer & Co., Branford, Conn.
Steubenville Mfg. Co., Keithsburg, Ill.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oilless Bearings**
North American Metalline Co., Long Island City, N. Y.
- Ore Breakers**
Aultman Co., Canton, O.
Cresson, Geo. V. Co., Phila., Pa.
- Ores**
Blair, Reed F. Co., Pittsburgh, Pa.
Samuel, Frank, Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.
- Ox Shoes**
Scranton Forging Co., Scranton, Pa.
Woodruff, Walter W. & Sons, Mt. Carmel, Conn.
- Packing**
Boston Belting Co., Boston, Mass.
Morrison, Robert, St. Louis, Mo.
Peck, Stow & Wilcox Mfg. Co., 16 Warren Street, N. Y.
- Packing, Iron**
Smooth On Mfg. Co., Jersey City, N. J.
- Paints**
Dixon, Jos. Crucible Co., Jersey City.
- Pants Stretcher**
Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors**
Goepel & Macgovern, 290 Broadway, N. Y.
Harrington, Geo. R., Washington, D. C.
Howson & Howson, Philadelphia and Washington.
Stockings, E. B., Washington, D. C.
- Pattern Letters**
Cleveland Galvanizing Works, Cleveland, O.
St. Louis Electrotyping Foundry, St. Louis
- Pattern Makers**
Birnbau, C., Cleveland, O.
- Pattern Making Machinery**
American Machy Co., Grand Rapids, Mich.
- Patterns**
Norwalk Pattern & Mfg. Co., So. Norwalk, Conn.
- Perforated Metal**
Clinton Wire Cloth Co., Clinton, Mass.
Erdie & Schenck, Rochester, N. Y.
Harrington & King Perforating Co., Chicago, Ill.
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
- Phosphor Bronze**
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
Phosphor Bronze Smelting Co., Limited, Philadelphia, Pa.
- Phosphor Tin**
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Halk & Naumann, 518 Pearl St., N. Y.
- Plane Plate Manufacturers**
Hampden Iron Co., Brooklyn, N. Y.
- Picture Wire**
Lawson Mills Co., Norwich, Conn.
- Pig Casting Machines**
Heyl & Patterson, Pittsburgh, Pa.
- Pig Iron**
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.
Ashland Steel Co., Ashland, Ky.
Bairst, C. R. & Co., Phila., Pa.
Cherry Valley Iron Co., Pittsburgh, Pa.
Dimmick, J. K. & Co., Phila., Pa.
Hickman, Williams & Co., Chicago, Ill.
Houston, C. B. & Co., Philadelphia, Pa.
Nicoll, B. & Co., 324 Wall St., N. Y.
Samuel, Frank, Philadelphia, Pa.
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.
Snyder, W. P. & Co., Pittsburgh, Pa.
Superior Charcoal Iron Co., Grand Rapids, Mich.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Tidewater Steel Co., Phila., Pa.
Virginia Iron, Coal and Coke Co., Bristol, Va., Tenn.
- Pig Iron Analysis**
See W. B. Co., San Francisco, Cal.
- Pig Iron Storage**
Am. Pig Iron Storage Warehouse Co., 4 Wall St., N. Y.
- Pig Lead**
Penna. Smelting Co., Pittsburgh, Pa.
- Pipe Drivers**
Vulcan Iron Works, Chicago, Ill.
- Pipes**
Washington Tool Co., Owatonna, Wis.
Harrisburg Pipe Bending Co., Harrisburg, Pa.
National Pipe Bending Co., New Haven, Conn.
National Tube Co., Pittsburgh, Pa.
Whitlock Coil Pipe Co., Hartford, Ct.
- Pipe Coupling**
Williams, J. H. & Co., Brooklyn, N. Y.
- Pipe Cutting and Threading Machines**
Bison & Keeler Mfg. Co., Edwardsville, Ill.
Curtis & Curtis, Bridgeport, Conn.
Jarecki Mfg. Co., Erie, Pa.
Maurer Mfg. Co., Toledo, O.
Saunders' Sons, D., Yonkers, N. Y.
- Pipe Fittings, &c.**
Jarecki Mfg. Co., Erie, Pa.
McNab & Harlin Mfg. Co., N. Y.
- Pipe, Riveted Steel**
Pollock, W. B. Co., Youngstown, O.
See Wm. R. & Sons, Pittsburgh.
- Pipe, Water and Gas**
Millar, C. & Son Co., Utica, N. Y.
National Tube Co., Pittsburgh, Pa.
Red Jacket Mfg. Co., Davenport, Iowa.
U. S. Cast Iron Pipe & Foundry Co., Phila., Pa.
Warren City Boiler Works, Warren, O.
Wood, R. D. & Co., Philadelphia, Pa.
- Piston Rods, Tobie Bronze**
Ansonia Brass & Copper Co., 99 John St., N. Y.
- Planes**
Stacy, Rule & Level Co., N. Y.
- Planers**
Amer. Tool Works Co., Cincinnati, O.
Bairst, U. Machinery Co., Pittsburgh, Pa.
Detrick & Harvey Mch. Co., Baltimore.
Draper Mch. Tool Co., Worcester, Mass.
Pond Machine Tool Co., Plainfield, N. J.
Whitcomb Mfg. Co., Worcester, Mass.
Wilson, W. A., Rochester, N. Y.
- Plated Ware**
International Silver Co., Meriden, Ct.
Myers, S. F. Co., 48-50 Maiden Lane, N. Y.
- Plates, Iron and Steel**
Jones & Laughlin, Ltd., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Singer, Nimitz & Co., Inc., Pittsburgh, Pa.
Tidewater Steel Co., Phila., Pa.
Wood, Alan Co., Philadelphia.
- Plate Iron Work**
Scuffa, Wm. B. & Sons, Pittsburgh.
- Pliers**
Bridgeport Mfg. Co., Bridgeport, Conn.
Cronk Hanger Co., Elmira, N. Y.
Morrill, Chas., Broadway and Chambers Sts., N. Y.
- Pneumatic Tools**
Chicago Pneumatic Tool Co., Chicago, Ill.
Phila. Pneumatic Tool Co., Phila., Pa.
Standard Pneumatic Tool Co., Chicago.
- Pocket Knives**
Catawagus Cutlery Co., Little Valley, N. Y.
Northfield Knife Co., Northfield, Conn.
- Pokers and Lifters**
Troy Nickel Works, Troy, N. Y.
- Polishing Stands**
Ross, Josiah, Buffalo, N. Y.
- Polishing Wheels**
Divine Bros. Co., Utica, N. Y.
- Portable Track**
Atlas Bolt & Screw Co., Cleveland, O.
- Post Hole Diggers**
Kohler, F. E. & Co., Canton, O.
Tucker & Dorsey Mfg. Co., Indianapolis
- Poultry Fencing**
DeKaib Fence Co., DeKaib, Ill.
- Poultry Nettings**
Gibbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Tyler, W. S. Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Power Hack Saws**
Hofer Mfg. Co., Freeport, Ill.
- Power Hammers**
Beaudry & Co., Boston, Mass.
Bradley Co., Syracuse, N. Y.
Dienelt & Eisenhardt, Philadelphia.
Dubuque Mch. Concern, Dubuque, Ia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Hilbert-Freiberg Mch. Tool Co., Cincinnati, O.
Kiddler, R. E., Worcester, Mass.
Long & Allister Co., Hamilton, Ohio.
Miner & Peck Mfg. Co., New Haven, Ct.
Scranton & Co., The New Haven, Conn.
- Power Transmitting Machinery**
Cresson, Geo. V. Co., Phila., Pa.
Dodge Mfg. Co., Milwaukee, Ind.
Norwalk Iron Wks. Co., So. Norwalk, Ct.
- Pressed Metal Work**
Avery Stamping Co., Cleveland, Ohio.
- Presses, Power**
Adrian Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Cook, T. W. G. & Head, St. N. Y.
Cross & Speirs Mch. Co., Waterbury, Ct.
Ferracute Mach. Co., Bridgeport, N. J.
Hibbard, W. H., Brooklyn, N. Y.
Hilles & Jones Co., Wilmington, Del.
Lefter, Chas. & Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct.
Merriman, A. H., Meriden, Conn.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niagara Machine & Tool Wks., Buffalo.
Perkins Machine Co., Boston, Mass.
Phila. Machine Tool Co., Phila., Pa.
Shuster, F. B. Co., New Haven, Conn.
- Proctiles**
National Tube Co., Pittsburgh, Pa.
- Pruning Shears**
Cronk Hanger Co., Elmira, N. Y.
- Pulleys**
Amer. Pulley Co., Phila., Pa.
Dodge Mfg. Co., Milwaukee, Ind.
Eastern Machinery Co., New Haven, Ct.
Evans, G. F., Boston, Mass.
Forster Pulley Works, Rochester, N. Y.
Hess, Snyder & Co., Massillon, O.
Jones & Laughlin, Ltd., Pittsburgh, Pa.
Ohio Pulley Co., Marion, O.
Saginaw Mfg. Co., Saginaw, Mich.
Woods, T. B. Sons, Chambersburg, Pa.
- Pump Shafts**
Donohue, John T. & Co., Baltimore, Md.
- Pump Churns**
Cleveland Galvanizing Works, Cleveland, Ohio.
- Pumping Machinery**
Cook, A. D., Lawrenceburg, Ind.
Filer & Stowell Co., Milwaukee, Wis.
Ingersoll-Sergeant Drill Co., 26 Cortlandt St., N. Y.
Lake City Engineering Co., Erie, Pa.
McGowan, J. H. & Co., Cincinnati, O.
Southward Fdry & Mch. Co., Philadelphia, Pa.
- Pumps**
Atrol Pump Co., Athol, Mass.
Barnes Mfg. Co., Mansfield, O.
Deming Co., Boston, Mass.
Edson Mfg. Co., Boston, Mass.
Flint & Walling Co., Kendallville, Ind.
Hess, Snyder & Co., Massillon, O.
Humphreys Mfg. Co., Mansfield, O.
Myers, F. E. & Bro., Ashland, Ohio.
Red Jacket Mch. Co., Davenport, Ia.
St. Joseph Pump & Mfg. Co., St. Joseph, Mo.
Sandwich Enterprise Co., Sandwich, Ill.
Wilder, S. & Co., Holliston, Mass.
- Punches**
Morrill, Chas., Broadway and Chambers Sts., N. Y.
- Punches, Conductors'**
Meyers, Fred. J. Mfg. Co., Hamilton, O.
Woodman, R. Mfg. & Supply Co., Boston, Mass.
- Punches and Shears, Hand and Power**
Bertach & Co., Cambridge City, Ind.
Bethlehem Foundry & Machine Co., So. Bethlehem, Pa.
Bicknell Hdw. Co., Jacksonville, Wis.
Bliss, E. W. Co., Brooklyn, N. Y.
Heartley Machine Variety Iron & Tool Works, Toledo, Ohio.
Hilles & Jones Co., Wilmington, Del.
Long & Allister Co., Hamilton, Ohio.
Merick, C. S. & Co., New Haven, Conn.
New Doty Mfg. Co., Janesville, Wis.
Royersford Fdry & Mch. Co., Royersford, Pa.
Williams, White & Co., Moline, Ill.
- Punching and Shearing**
Harrington & King Perforating Co., Chicago, Ill.
- Push Carts**
Syracuse Chilled Plow Co., Syracuse.
- Pyrometers**
Brown, Edward, Phila., Pa.
Gebling, Steinbart & Co., Ltd., Carlsstadt, N. J.
- Quotation Records**
Globe-Wernicke Co., Cincinnati, Ohio.
- Railroads**
C. C. & St. L. R. R., Cincinnati, O.
- Railways, Industrial**
Hunt, C. W. Co., West New Brighton, N. Y.
- Rat and Mouse Traps**
Burditt & Williams, Boston, Mass.
- Ratchet Drums**
Keston, Wm. Co., Buffalo, N. Y.
- Rawhide Gears**
Nazel & Basset, Philadelphia, Pa.
- Razors**
Buck Bros., Millbury, Mass.
Fox Cutlery Co., Dubuque, Iowa.
Southington Cutlery Co., Southington, Conn.

Razor Hones
Pike Mfg. Co., Pike Station, N. H.
Reading Stands
Allen, D. H. & Co., Miamisburg, O.
Reamers
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Recording Gauges
Bristol Co., Waterbury, Conn.
Schling, Stenbart & Co., Ltd., Carlstadt, N. J.
Reels
Hendryx, A. B. Co., New Haven, Conn.
Refrigerating Machinery
York Mfg. Co., York, Pa.
Refrigerators
Maine Mfg. Co., Nashua, N. H.
Registers
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.
Relaying Rails
Donaldson & Newton, Phila., Pa.
Isaac Joseph Iron Co., Cincinnati, O.
May & Spalding, 32 Broadway, N. Y.
Steel Rail Supply Co., 130 B'way, N. Y.
Reloading Tools
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Ideal Mfg. Co., New Haven, Conn.
Repairing Sets, Family
Mitchell, W. B. Chicago, Ill.
Schreyers, M. Sons & Co., Chicago, Ill.
Star Steel Plate Co., Newark, N. J.
Repair Outfits, Farmers
Imperial Bldg. & Sng Co., Racine, Wis.
Revolution Counter
Pittkin, A. B. Machinery Co., Providence, R. I.
Parker Mfg. Co., Elizabeth, N. J.
Revolvers
Harrington & Richardson Arms Co., Worcester, Mass.
Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.
Rheostats
Electric Controller & Supply Co., Cleveland, O.
Rides
Marlin Fire Arms Co., New Haven, Ct.
Remington Arms Co., 315 B'way, N. Y.
Stevens Arms & Tool Co., Chicopee Falls, Mass.
Rins, Rollers
Shuster, F. B. Co., New Haven, Conn.
Riveters
Phila. Pneumatic Tool Co., Phila., Pa.
Riveters, Pneumatic
Chicago Pneumatic Tool Co., Chicago.
Rivets
American Iron & Steel Mfg. Co., Lebanon, Pa.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Burden Iron Co., Troy, N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
McInnes, C. E. & Co., Phila., Pa.
Plymouth Mills, Plymouth, Mass.
Rockford Bolt Works, Rockford, Ill.
Townsend C. C. & E. P., New Brighton Pa.
Riveting Machines
Bethlehem Foundry & Mch. Co., So. Bethlehem, Pa.
Shuster, F. B. Co., New Haven, Conn.
Roadsters and Bakers
Shepard, Sidney & Co., Buffalo, N. Y.
Roll Mill Machinery
Bradstock Machine & Mfg. Co., Bradstock, Pa.
Morgan Construction Co., Worcester, Mass.
Roll Turning Tools
Trethewey, Sam'l & Co., Ltd., Pittsburgh
Roller Bearings
Ball Bearing Co., Boston, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
Rollers
Fisher, J. K. & Sons, Monroe, Mich.
Rolling Mill Machinery
Booth, The Lloyd Co., Youngstown, O.
Everson, B. M., Pittsburgh, Pa.
Farrell Fdry. & Mch. Co., Ansonia, Ct.
Frank-Kneeland Mach. Co., Pittsburgh
Garrison, A. Foundry Co., Pittsburgh
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
Penna. Engineering Wks., New Castle, Penna.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Rolls, Chilled, Sand and Steel
Booth, The Lloyd Co., Youngstown, O.
Farrell Fdry. & Mch. Co., Ansonia, Ct.
Frank-Kneeland Mach. Co., Pittsburgh
Garrison, A. Fdry. Co., Pittsburgh, Pa.
Lorain Foundry Co., Lorain, Ohio.
Mesta Machine Co., Pittsburgh, Pa.
Phila. Roll & Mch. Co., Philadelphia, Pa.
Seaman, Sleeth Co., Pittsburgh
Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
Youngstown Foundry & Machine Co., Youngstown, O.
Roofing and Siding
Asphalt Ready Roofing Co., 120 Water St., N. Y.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kamberg Roofing Co., Canton, O.
Seafie, Wm. B. & Sons, Pittsburgh
Youngstown Iron & Steel Roofing Co., Youngstown, O.
Ropes and Cordage
American Mfg. Co., 63 Wall St., N. Y.
Waterbury Rope Co., 63 South St., N. Y.
Rope and Web Goods
Curtis Mfg. Co., West Troy, N. Y.
Rope Shield
Columbia Co., Columbus, Ohio.
Rope Transmission and Hoisting
American Mfg. Co., 63 Wall St., N. Y.
California Wire Works, San Francisco, Cal.
Hill, C. W. Co., West New Brighton, L. I.
Leach, A. & Sons, Rope Co., St. Louis
Woods, T. B. Sons Chambersburg, Pa.
Rubber Goods
Belting Co., Boston, Mass.
Gould, H. O., Bridgeport, Conn.
Powers Rubber Mfg. Co., 16 Warren Street, N. Y.
Rules
Stanley Rule Co., Saginaw, Mich.

Stanley Rule & Level Co., 29 Chambers St., N. Y.
Sad Irons
Williams, A. C., Ravenna, O.
Sand Blast Apparatus
Ward, Edgar T. & Sons, Boston, Mass.
Sand Paper
Baeder, Adamson & Co., Phila., Pa.
Gram, Jno. H. & Co., 113 Chambers St., N. Y.
Sash Balances
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.
Stroeter, N. R. & Co., Rochester, N. Y.
Sash Cords and Chains
Bridgeport Chain Co., Bridgeport, Conn.
Morton, Thos., 65 Elizabeth, N. Y.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Sash Locks
Fitch, W. & E. T. Co., The, New Haven, Conn.
Ives, H. B. & Co., New Haven, Conn.
Oedinger, J. L., Chicago, Ill.
Sash Pulleys
Fox Machine Co., Grand Rapids, Mich.
Grand Rapids Hardware Co., Grand Rapids, Mich.
Palmer Hardware Mfg. Co., Troy, N. Y.
Sash Weights
Barney & Reed Mfg. Co., Boston, Mass.
Brown, E. E. & Co., Philadelphia, Pa.
Enterprise Foundry Co., Cincinnati, O.
Sausage Stuffers
National Specialty Mfg. Co., Phila., Pa.
Saws
Atkins, E. C. & Co., Indianapolis, Ind.
Bishop, Geo. H. & Co., Cincinnati, Ohio.
Diston, Henry & Sons, Inc., Phila., Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.
Saw Clamps
Dust, R. Henry & Sons, Inc., Phila., Pa.
Saw Guides
Thomson Bros. & Co., Lowell, Mass.
Saw Handles
Ladd, W. C., Bristol, Conn.
Saw Sets
Damon, Henry & Sons, Inc., Phila., Pa.
Morris, Chas., Broadway and Chambers St., N. Y.
Taintor Mfg. Co., 9 to 15 Murray, N. Y.
Saw Tools
Atkins, E. C. & Co., Indianapolis, Ind.
Scales
American Cutlery Co., Chicago, Ill.
Chattillon, John & Sons, 33-39 Cliff, N. Y.
Chicago Seal Co., Chicago, Ill.
Pelouse Scale & Mfg. Co., Chicago, Ill.
Reading Hardware Co., Reading, Pa.
Standard Scale & Supply Co., Pittsburgh, Pa.
Scrap Metals
Armstrong, E. S. & Bro., Atlanta, Ga.
Blake, M. J. & M., 11th Ave. and 15th St., N. Y.
Botcher, C., Hoboken, N. J.
Greiner, F., Philadelphia, Pa.
Hitner, H. A. & Sons, Phila., Pa.
Hotelier, Theo. & Co., Buffalo, N. Y.
Leonard, John & Co., 22 Broadway, N. Y.
Miles, E. O. & Co., Altan, S. Ga.
N. J. Iron & Metal Co., Paterson, N. J.
Perry, Wm. H. Co., Providence, R. I.
Phillips, F. E. & Sons Co., Phila., Pa.
Rogers, W. H., Bridgeport, Conn.
Sumner, M. Sons, Brooklyn, N. Y.
Smith, Morton B. Co., New York
Scrap Metal Breakers
Birdsboro Iron & Steel Breaking Co., Birdsboro, Pa.
Scrapers, Road
American Steel Scraper Co., Sidney, O.
Aultman Co., Canton, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Sidney Steel Scraper Co., Sidney, O.
Syracuse Chilled Plow Co., Syracuse, N. Y.
Screen Hanger
Winter, K. G., Minneapolis, Minn.
Screens, Perforated Metal
Harrington & King Perforating Co., Chicago, Ill.
Screens, Window and Door
Doroy, Edw. & Sons, Philadelphia, Pa.
Screw Cutting Dies
Card, S. W. Mfg. Co., Mansfield, Mass.
Geometric Drill Co., Westville, Conn.
Rogers, Jno. M. Boat Gauge & Drill Wks., Gloucester City, N. J.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
Winter Bros., Wrentham, Mass.
Screw Drivers
Brown, R. H. & Co., New Haven, Conn.
Gay, Geo. E., Augusta, Me.
Goodell-Pratt Co., Greenfield, Mass.
Mayhew, H. H. Co., Shelburne Falls, Mass.
New England Specialty Co., No. Easton, Mass.
North Bros. Mfg. Co., Philadelphia, Pa.
Sawyer Tool Co., Fitchburg, Mass.
Tower & Lyon, 35 Chambers St., N. Y.
Union Mfg. Co., Buffalo, N. Y.
Screw Machinery
American Tool Wks. Co., Cincinnati, O.
Baker Bros., Toledo, O.
Brown & Sharpe Mfg. Co., Providence, Costello, J. E. Mch. Wks., Brooklyn, N. Y.
Draper Mach. Tool Co., Worcester, Mass.
Garvin Machine Co., Spring and Varick Sts., N. Y.
Jones & Lamson Mch. Co., Springfield, Vt.
Windsor Mch. Co., Windsor, Vt.
Screws
Coach
Hall's Sam'l Sons, 229 West 10th St., N. Y.
Machine
Hall, Wm. H. Mfg. Co., Pawtucket, R. I.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Chicago Screw Co., Chicago, Ill.
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.
Hillman Screw Co., Chicago, Ill.
Miles, F. S., 205 Quarry, Philadelphia, Pa.
New Britain Hdw. Mfg. Co., New Britain, Conn.
Niazara - crew Co., Buffalo, N. Y.
Phila. Mach. Screw Works, Phila., Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Read & Curtis Mch. Screw Co., Worcester, Mass.
Rhode Island Tool Co., Providence, R. I.
Southington Cutlery Co., Southington, Conn.
Worcester Mch. Screw Co., Worcester.

Wood
American Screw Co., Providence, R. I.
Franklin Moore Co., Winsted, Conn.
Reading Screw Co., Norristown, Pa.
Southington Cutlery Co., Southington, Conn.
Scroll Saws
Barnes, W. F. & John Co., Rockford, Ill.
Millers Falls Co., 38 Warren St., N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Scythe Stones and Whetstones
Cleveland Stone Co., Cleveland, O.
Pike Mfg. Co., Pike Station, N. H.
Seamless Steel Tubes
Ivins Eilwood, 487 Broadway, N. Y.
Janney, Stelmets & Co., Phila., Pa.
National Tube Co., Pittsburgh, Pa.
Sewing Machines
National Sewing Machine Co., Belvidere, Ill.
Shafting
American Steel & Wire Co., Chicago, Ill.
Crescent, Geo. V. Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Mch. Co., Philadelphia, Pa.
Finished Steel Co., Youngstown, O.
Jones & Laughlins Co., Pittsburgh, Pa.
Parsons, J. W., Perth Amboy, N. J.
Pittsburgh Steel Shafting Co., Rankin, Pa.
Stow Mfg. Co., Binghamton, N. Y.
Woods, T. B. Sons, Chambersburg, Pa.
Shaped Iron and Steel
Allentown Rolling Mill, Allentown, Pa.
American Steel Hoop Co., Battery Park Building, N. Y.
Forest City Steel & Iron Co., Cleveland, Ohio.
Lindsay, W. W. & Co., Phila., Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
National Steel Co., Bridgeport, O.
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Phila., Pa.
Pittsburgh Steel Shafting Co., Rankin, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Shapers
Barker-Chard Mach. Tool Co., Cincinnati, O.
Cincinnati Shaper Co., Cincinnati, O.
Gould & Eberhardt, Newark, N. J.
Perkins Machine Co., Boston, Mass.
Potter & Johnston Co., Pawtucket, R. I.
Shear Knives
Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.
Trethewey, Sam'l & Co., Ltd., Pittsburgh
Shears and Scissors
American Sheet & Bridgeport, Conn.
Cattaraugus Cutlery Co., Little Valley, N. Y.
Heinrich, R. Sons Co., Newark, N. J.
Jackson Knife & Shear Co., Fremont, O.
Lane Cutlery Works, Cedar Rapids, Ia.
New York Cutlery Co., Phila., Pa.
Webschaeff, Hilger, Ltd., 9-15 Murray St., N. Y.
Shears, Metal
Carlin's, Thomas Sons Co., Allegheny, Pa.
Sheet Bars
National Steel Co., Battery Park Building, N. Y.
Sheet and Bolt Copper
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Sheet and Rolled Brass
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Sheet Metal Machinery
Adrianne Mach. Works, Brooklyn, N. Y.
Sheets, Galvanized
American Sheet Steel Co., New York
McCullough Iron Co., Wilmington, Del.
Sheets, Iron and Steel
American Sheet Steel Co., New York
McCullough Iron Co., Wilmington, Del.
National Steel Co., Bridgeport, O.
Republic Iron & Steel Co., Chicago, Ill.
Singer, Nimitz & Co., Inc., Pittsburgh
Waters, L. & R. Co., Philadelphia, Pa.
Young, J. C., Philadelphia
Sheet Zinc
Hillman Zinc Co., Peru, Ill.
Mathlessen & Hegeler Zinc Co., La Salle, Ill.
Shelf Boxes
Heller Box Co., Montclair, N. J.
Moore, C. P., Ravenswood, W. Va.
Shelf Ladders
Bicycle Steel Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Milbradt, G. A. & Co., St. Louis, Mo.
Moore, C. P., Ravenswood, W. Va.
Shelving
Varr, N. J. D. Mfg. Co., Chicago, Ill.
Shipbuilders
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.
Shock Compressor
Bucher, J. B., Greensburg, Ind.
Shovels, Spades and Scoops
St. Louis Shovel Co., St. Louis, Mo.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Silver Plated Flat and Hollow Ware
Benedict, M. S. Mfg. Co., E. Syracuse, N. Y.
Sinks
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Skates, Ice
Dane, Stoddard & Co., Boston, Mass.
Union Hardware Co., Torrington, Conn.
Skate Sharpeners
Osborn Mfg. Co., Cleveland, O.
Skylights
Drouve, G. Co., Bridgeport, Conn.
Slaw Cutters
Tricker & Dorsey Mfg. Co., Indianapolis, Ind.
Smelting Works
Reeves, Paul S., 700 S. Broad, Phila.
Soapstone Goods
Pike Mfg. Co., Pike Station, N. H.
Snap Wagon Pencils
Dodge, D. M. Mfg. Co., Chattanooga, Tenn.
Soldering Copper Hurdles
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Soldering Coppers
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Spark Guard
Howes, S. M. Co., Boston, Mass.

Speaking Tubes
Ostrander, W. H. & Co., 204 Fulton St., N. Y.
Specialty Manufacturers
Franklin, H. H. Mfg. Co., Syracuse, N. Y.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Spelter
Hillman Zinc Co., Peru, Ill.
Mathlessen & Hegeler Zinc Co., La Salle, Ill.
Penna. Smelting Co., Pittsburgh, Pa.
Spelter Solder
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Spikes
American Iron & Steel Mfg. Co., Lebanon, Pa.
Spoons and Forks
International Silver Co., Meriden, Ct.
Sporting Goods
Dane, Stoddard & Co., Boston, Mass.
Spray Pumps—(See Pumps)
Springs
American Steel & Wire Co., Chicago, Ill.
Barnes, Wallace Co., Bristol, Conn.
Cary Spring Works, 240 W. 24th St., N. Y.
Chattillon, John & Sons, 33-39 Cliff St., N. Y.
Clark & owles, Plainville, Conn.
Cleveland Wire Spring Co., Cleveland, O.
Dunbar Bros., Bristol, Conn.
Gibson, W. D. Co., Chicago
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.
Scott, Chas. Spring Co., Phila., Pa.
St. Johns Spring Co., St. Johns, Mich.
Tuck Mfg. Co., Brockton, Mass.
Welch, T. F. Mfg. Co., Boston, Mass.
Springs, Wagon, Etc.
Wurster, F. W. & Co., Brooklyn, N. Y.
Spring Cotters
Brooks, M. S. & Sons, Chester, Conn.
Holinger Fence Co., Greenville, O.
Spring Hinges
Bommer Bros., Brooklyn, N. Y.
Coleman Hdw. Co., Chicago, Ill.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
Sprocket Chain
Buhl Mallesbarre Co., Detroit, Mich.
Spur Couters, Foot and Power
Shuster, F. B. Co., New Haven, Conn.
Stacks
Scaife, Wm. B. & Sons, Pittsburgh
Stamped Ware
Jenkinson, R. C. & Co., Newark, N. J.
Keen & Hagerty, Mfg. Co., Baltimore, Md.
New York Stamping Co., Brooklyn, N. Y.
Stamping, Sheet Metal
American Hdw. Mfg. Co., Ottawa, Ill.
American Railway Supply Co., 24 Park Place, N. Y.
American Steel Scraper Co., Sidney, O.
Clay Stamping Co., Cleveland, Ohio
Cleveland Stamping & Tool Co., Cleveland, Ohio.
Davis & Buxton Stamping Co., Worcester, Mass.
Goodwin & Kintz Co., Winsted, Conn.
Houghton & Buxton Mfg. Co., Worcester, Mass.
Jenkinson, R. C. & Co., Newark, N. J.
Konigslow, E. & Bro., Cleveland, Ohio.
McKenna Brass Co., Ltd., Pittsburgh
Mossberg, Frank Co., Attleboro, Mass.
Reed & Curtis Mch. Screw Co., Worcester, Mass.
Seamless Metal Ware Co., 277 Broadway, N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
Wilson & Smith, Worcester, Mass.
Staple Machines, Automatic
Shuster, F. B. Co., New Haven, Conn.
Staples and Double Potted Tacks
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
Titchener, K. H. & Co., Binghamton, N. Y.
Steam Cookers
Peerless Cooker Co., Buffalo, N. Y.
Steam Hammers, &c.
Dienelt & Eisenhardt, Philadelphia
Dudgeon, Richard, 24 Columbia St., N. Y.
Stiers, Wm. & Co., Inc., Phila., Pa.
Steam Heating
Webster, Warren & Co., Camden, N. J.
Steam Separators
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden
Steam Shovels
Tnew Automatic Shovel Co., Lorain, O.
Steam Specialties
Crosby Steam Gauge & Valve Co., Boston
Lunkenheimer Co., Cincinnati, O.
Mason Regulator Co., Boston, Mass.
Steel Balls
Cleveland Ball & Screw Co., Cleveland
Steel Buildings
American Bridge Co., East Berlin, Ct.
Boston Bridge Works, Boston, Mass.
New England Structural Co., Boston, Mass.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Scaife, Wm. B. & Sons, Pittsburgh, Pa.
Steel, Cold Rolled Strip
Wilnot & Hobbs Mfg. Co., Bridgeport, Wolt, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
Steel Flanges, Weldless
Latrobe Steel Co., Philadelphia, Pa.
Steel Forgings and Castings
Bethlehem Steel Co., So. Bethlehem, Pa.
Steel Hoops
American Steel Hoop Co., Battery Park Building, N. Y.
Steel Importers
Hobson, Houghton & Co., 36 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John St., N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Wheelock, Lovejoy & Co., New York and Boston
Steel (Mushet's) Special
Jones, B. M. & Co., Boston
Steel Manufacturers
American Steel Hoop Co., Battery Park Building, N. Y.
Ashland Steel Co., Ashland, Ky.
Baker, Hermann & Co., 103 Duane St., New York
Braeburn Steel Co., Braeburn, Pa.
Champion Iron & Steel Co., Muskegon, Mich.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.

- Frankford Steel Co., Philadelphia.**
Hobson, Houghton & Co., 95 John St., N. Y.
- Jessop, Wm. & Sons, Sheffield, England,**
or 91 John St., New York.
- Jones & Laughlin, Ltd., Pittsburgh, Pa.**
Kidd Bros. & Burgher Steel Wire Co., McKees Rocks, Pa.
- La Belle Steel Co., Pittsburgh, Pa.**
Lorain Steel Co., Lorain, Ohio.
- Lukens Iron & Steel Co., Coatesville, Pa.**
Nash, Geo. & Co., Chicago.
- National Steel Co., Battery Park Building, N. Y.**
- Newkirk, J. B. & Co., Philadelphia, Pa.**
Otis Steel Co., Ltd., Cleveland, Ohio.
- Republic Iron & Steel Co., Chicago, Ill.**
Rowland, Wm. & Harvey, Frankford, Philadelphia.
- Singer, Nimick & Co., Inc., Pittsburgh.**
Tudewater Steel Co., Phila., Pa.
- Wardlaw, S. & C., Sheffield, England.**
Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Manufacturers' Agents**
Ogden & Wallace, 577-583 Greenwich St., New York.
- Snyder, W. P. & Co., Pittsburgh, Pa.**
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
- Virginia Iron, Coal and Coke Co., Bristol, Va.—Tenn.**
- Steel, Self Hardening**
Denman & Davis, 85-87 John St., N. Y.
- Steel Rails**
Lorain Steel Co., Lorain, Ohio.
- Steel Stamps and Stencil Dies**
Eucker, L. A. Stamp Wks., Little Ferry, N. J.
- New, Geo. M. Jr., 61 Fulton St., N. Y.**
Schwerdtle & Siebert, Bridgeport, Conn.
- Steel, Tool**
Braeburn Steel Co., Braeburn, Pa.
- Crescent Steel Co., Pittsburgh, Pa.**
Denman & Davis, 85-87 John St., N. Y.
- Frankford Steel Co., Philadelphia, Pa.**
Jessop, Wm. & Sons, Sheffield, England, 91 John St., N. Y.
- Jones, B. M. & Co., Boston, Mass.**
La Belle Steel Co., Pittsburgh, Pa.
Nash, Geo. & Co., Chicago.
- Singer, Nimick & Co., Pittsburgh, Pa.**
- Step Ladders**
Handy Ladder Works, Cleveland, O.
- Step Ladders, Rolling**
Bicycle Step Ladder Co., Chicago, Ill.
- Coburn Trolley Track Mfg. Co., Holyoke, Mass.**
- Milbradt, G. A. & Co., St. Louis, Mo.**
Morley Bros., Saginaw, Mich.
- Stocks and Dies**
Card, B. W. Mfg. Co., Mansfield, Mass.
- Curtis & Curtis, Bridgeport, Conn.**
Hollands Mfg. Co., Erie, Pa.
- Jones & Lamson Mfg. Co., Springfield, Vt.**
- Jarocki Mfg. Co., Erie, Pa.**
Oster Mfg. Co., Cleveland, Ohio.
- Saunders' Sons, D., Yonkers, N. Y.**
Wells Bros. & Co., Greenfield, Mass.
- Wiley & Russell Mfg. Co., Greenfield, Mass.**
Winter Bros., Wrentham, Mass.
- Stone Cutting Machinery**
Gilmour, J., Bennett Bldg., N. Y.
- Stone Working Machinery**
Patch, F. K. Mfg. Co., Rutland, Vt.
- Stop Screws**
Read, A. P. & Co., Chicago, Ill.
- Store Fixtures**
Warren, J. N. Mfg. Co., Chicago, Ill.
- Storm Sash Hanger**
Winter, R. G., Minneapolis, Minn.
- Stove Hardware**
Troy Nickel Works, Troy, N. Y.
- Stove Linings**
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles**
Cheney, S. & Son, Manlius, N. Y.
- Stoves, Oil, Vapor and Gasoline**
Dangler Stove & Mfg. Co., Cleveland, O.
- Schneider & Trenkamp Co., Cleveland, Ohio.**
- Stove Trucks**
Howes, S. M. Co., Boston, Mass.
- Straightening Machines, Wire and Sheet Metal**
Shuster, F. B. Co., New Haven, Conn.
- Structural Iron and Steel Work**
American Bridge Co., East Berlin, Ct.
- Belmont Iron Works, Philadelphia, Pa.**
Boston Bridge Works, Boston, Mass.
- Eastern Bridge & Structural Co., Worcester, Mass.**
- Forest City Steel & Iron Co., Cleveland, Ohio.**
- Illinois Steel Co., Chicago, Ill.**
Moseley Iron Bridge & Roof Co., 39 Cortland St., N. Y.
- New England Structural Co., Boston, Mass.**
- Phoenix Iron Co., Philadelphia, Pa.**
Ritter-Conley Mfg. Co., Philadelphia, Pa.
- Stewart Iron Works, Cincinnati, Ohio.**
West Side Foundry Co., Troy, N. Y.
- Sulphuric Acid**
Mathieson & Leeger Zinc Co., La Salle, Ill.
- Swaging Machines**
Excelsior Needle Co., Torrington, Ct.
- Table Ware**
International Silver Co., Meriden, Ct.
- Tacks, Brads, Acc.**
Diamond Tack & Nail Works, Raynham, Mass.
- Grand Crossing Tack Co., Grand Crossing, Ill.**
- Milwaukee Tack Co., Milwaukee, Wis.**
Plymouth Mills, Plymouth, Mass.
- Flymouth & Barrett, Plymouth, Mass.**
Shelton Co., Birmingham, Conn.
- Stanley, G. W. & Co., Belleville, Ill.**
- Tack and Nail Machinery**
Kimball Bros. & Sprague, Brockton, Mass.
- Sweetzer, W. A., Brockton, Mass.**
- Tanks, Iron and Steel**
Manogue-Flagon Iron Co., Memphis, Tenn.
- Scaife, Wm. R. & Sons, Pittsburgh.**
- Tapes**
Larkin Rule Co., Saginaw, Mich.
- Tap Holder**
Ideal Machine Works, Hartford, Conn.
- Tapping Machines**
Hobell, Harvey, Bridgeport, Conn.
- Taps and Dies**
Besley, C. H. & Co., Chicago, Ill.
- Butterfield, C. O., Derby Line, Vt.**
Card, S. W. Mfg. Co., Mansfield, Mass.
- Reece, E. F. Co., Greenfield, Mass.**
Wells Bros. & Co., Greenfield, Mass.
- Wiley & Russell Mfg. Co., Greenfield, Mass.**
Winter Bros., Wrentham, Mass.
- Telephones**
Mianus Electric Co., Mianus, Conn.
- Rawson Electric Co., Elvira, Ohio.**
- Terne Plate**
American Tin Plate Co., N. Y.
- Thimble Skeins**
Mitchell, W. B., Chicago, Ill.
- Time Recorders**
Chicago Time Recorder Co., Chicago, Ill.
- Nanz, C. & Co., 127 Duane St., N. Y.**
Simplex Time Recorder Co., Gardner, Mass.
- Wagoner Watchman Clock Co., Grand Rapids, Mich.**
- Tin Mills**
Philadelphia Roll & Mch. Co., Phila., Pa.
- Phillips, F. R. & Sons Co., Phila., Pa.**
- Tinners' Tools and Machines**
Niagara Machine & Tool Works, Buffalo.
- Tin Plate**
American Tin Plate Co., N. Y.
- Champion Iron & Steel Co., Muskegon, Mich.**
- Merchant & Co., Inc., Philadelphia, Pa.**
- Tin Plate Machinery**
Lloyd Booth Co., Youngstown, Ohio.
- Tinware**
Keen & Hagerty, Baltimore, Md.
- Seamless Metal Ware Co., 277 Broadway, N. Y.**
- Tinware Machinery**
Shuster, F. B. Co., New Haven, Conn.
- Tobin Bronze**
Ansonia Brass & Copper Co., 99 John St., N. Y.
- Toe Calks, Steel**
Brick, F. F., Boston, Mass.
- Toe Clips**
Snow, L. T., New Haven, Conn.
- Toilet Goods, Gold and Silver Plated**
Benedict, M. S. Mfg. Co., E. Syracuse, N. Y.
- Tool Chests**
Am. Tool Chest Co., 300 W. Houston St., New York.
- Bliss, R. Mfg. Co., Fawtucket, R. I.**
- Tool Grinders**
Sellers, Wm. & Co., Inc., Phila., Pa.
- Union Mfg. Co., Buffalo, N. Y.**
- Tools**
Athol Machine Co., Athol, Mass.
- Braunsdorf-Mueller Co., Elizabeth, N. J.**
Brown, R. H. & Co., New Haven, Conn.
- Fray Jno. S. & Co., Bridgeport, Conn.**
Goodell Pratt Co., Greenfield, Mass.
- Mayhew, H. H. Co., Shelburne Falls, Mass.**
Millers Falls Co., 29 Warren St., N. Y.
- Myers, S. F. Co., 48-50 Maiden Lane, N. Y.**
Springfield Machine Screw Co., Springfield, Mass.
- Stanley Rule & Level Co., 29 Chambers St., New York.**
- Starrett, L. S. Co., Athol, Mass.**
Stevens, J. Arms & Tool Co., Chicopee.
- Tower & Lyon, 95 Chambers St., N. Y.**
- Tools, Blacksmith and Wheelwright**
Champion Blower & Forge Co., Lancaster, Pa.
- Wiley & Russell Mfg. Co., Greenfield, Mass.**
- Tools, Steam and Gas Fitters'**
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasoline**
Schneider & Trenkamp Co., Cleveland, O.
- Tote Boxes**
Clark, W. J. & Co., Salem, O.
- Toys, Iron**
Coleman Hardware Co., Chicago, Ill.
- Transom Openers**
Ormsby, E. A., Melrose, Mass.
- Tree Guard**
Hartman Mfg. Co., 309 Broadway, N. Y.
- Up-to-date Mfg. Co., Terre Haute, Ind.**
- Trimmers**
American Mach'y Co., Grand Rapids, Mich.
- Trolleys**
Box, Alfred & Co., Philadelphia, Pa.
- Trowels**
Bishop, Geo. H. & Co., Cincinnati, O.
- National Saw Co., Newark, N. J.**
- Trucks**
Boston & Lockport Block Co., Lockport, N. Y.
- Kilbourne & Jacobs Mfg. Co., Columbus, Lansing Wheelbarrow Co., Lansing, Mich.**
- Syracuse Chilled Plow Co., Syracuse, N. Y.**
- Tab Hoops**
Oatman Bros., Medina, Ohio.
- Table Expanders**
Henderson, A. I. Sons, Wilmington, Del.
- Tubes, Seamless Drawn Copper, Brass and Bronze**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Randolph-Cloves Co., Waterbury, Conn.**
- Tabing, Brass**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Irvine, Ellwood, 487 Broadway, N. Y.**
Phoenix Tube Co., Brooklyn, N. Y.
- Spofford, W. S. & Son, Providence, R. I.**
- Tabing, Iron**
Phoenix Tube Co., Brooklyn, N. Y.
- Tabing, Steel**
Best Transmission Co., Danbury, Ct.
- Irvine, Ellwood, 487 Broadway, N. Y.**
Janney, Steinmetz & Co., Phila., Pa.
- Lang's John S. Son & Co., 4 Fletcher St., New Haven, Ct. & Co., Phila., Pa.**
- National Tube Co., Pittsburgh, Pa.**
Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Tumbling Barrels**
Henderson Bros., Waterbury, Conn.
- Northern Engineering Works, Detroit, Mich.**
- Tungsten Metal**
Wolfson Works, Rosswell, Saxony.
- Turnbuckles**
Cleveland City Forge & Iron Co., Cleveland, O.
- Twist Drills**
Cleveland Twist Drill Co., Cleveland.
- Graham, John H. & Co., 113 Chambers St., N. Y.**
- Morse Twist Drill & Machine Co., New Bedford, Mass.**
- Stecomb, J. T. & Co., Providence R. I.**
Standard Tool Co., Cleveland, O.
- Twist Drill Grinders**
Heald, L. S. & Son, Barre, Mass.
- Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.**
- Union Couplings**
Dart, E. M. Mfg. Co., Providence, R. I.
- Unions, Brass**
Notte Brass Co., Springfield, Ohio.
- Upholsterers' Hardware**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Valve Remodeling Device**
Quincy Valve & Mfg. Co., Quincy, Ill.
- Valves, Gas, Water and Steam**
Ashton Valve Co., Boston, Mass.
- Chapman Valve Mfg. Co., Boston.**
Crosby Steam Gate & Valve Co., Boston.
- Jenkins Valve, 71 John, N. Y.**
Kennedy Valve Mfg. Co., 75 John St., N. Y.
- Lunkenheimer Co., Cincinnati, Ohio.**
McNab & Harlin Mfg. Co., 56 John, N. Y.
- Mason Regulator Co., Boston, Mass.**
Wood, R. D. & Co., Philadelphia, Pa.
- Varnish**
Standard Varnish Works, 29 Broadway, N. Y.
- Vegetable Slicers**
Streeter, N. R. & Co., Rochester, N. Y.
- Ventilating Fans**
American Blower Co., Detroit, Mich.
- Bayley, Wm. & Sons Co., Milwaukee, Wis.**
Boston Blower Co., Hyde Park, Mass.
- Buffalo Forge Co., Buffalo, N. Y.**
Exeter Machine Wks., Boston, Mass.
- Perkins, B. F. & Son, Holyoke, Mass.**
- Ventilating System**
Ormsby, E. A., Melrose, Mass.
- Ventilator Appliances**
Howard & Morse, 45 Fulton St., N. Y.
- Ventilators**
Drouve G. Co., Bridgeport, Conn.
- Merchant & Co., Inc., Philadelphia, Pa.**
Panama Fancoast Ventilator Co., Phila., Pa.
- Ventilator Openers**
Ormsby, E. A., Melrose, Mass.
- Vertical Milling Machines**
Intersol Milling Machine Co., Rockford, Ill.
- Vices**
Athol Machine Co., Athol, Mass.
- Bignall & Keeler Mfg. Co., Edwardsville, Ill.**
- Holland Mfg. Co., Erie, Pa.**
Howard Iron Works, Buffalo, N. Y.
- Lewis Tool Co., 44 Barclay St., N. Y.**
Massey Vice Co., Chicago, Ill.
- Parker, Chas. Co., Meriden, Conn.**
Prentiss Vice Co., 44 Barclay, N. Y.
- Utica Drop Forge & Tool Co., Utica, N. Y.**
- Wagon Jacks**
Covert Mfg. Co., West Troy, N. Y.
- Covert's Saddlery Works, Farmer, N. Y.**
Lane Bros. Co., Foughkeepa, N. Y.
- Washers**
H. W. Sam'l Sons, 229 West 10th St., N. Y.
- Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.**
- Nut & Washer Mfg. Co., Milwaukee, Wis.**
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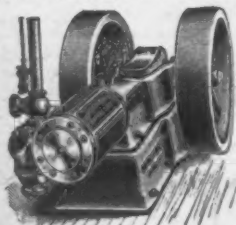


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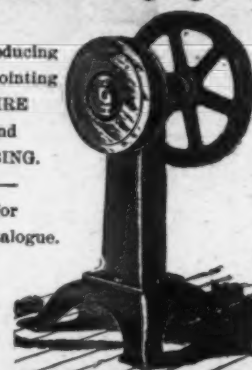
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